The Burnett School of Biomedical Sciences is a part of the College of Medicine at the University of Central Florida (UCF). The mission of the School is to provide quality undergraduate and graduate programs in the biomedical sciences and build vigorous research programs. The School offers the second most-popular undergraduate program in the university, B.S. in Biomedical Sciences, which meets the admission requirements for medical and other health professional school programs.

The Burnett School of Biomedical Sciences has 2,700 undergraduate majors in the Biomedical Sciences (including Biomedical Sciences Preprofessional Concentration), Biotechnology, and Medical Laboratory Sciences. The Biomedical Sciences B.S. offers two tracks within the major: Molecular Microbiology and Molecular and Cellular Biology. These tracks target students looking into specialized research masters and Ph.D. programs. The classes for the School's undergraduate programs are offered in the UCF Main Campus. A few select courses for the Biomedical Sciences B.S. are also offered at Valencia Osceola campus.

Students interested in professional schools are recommended to take SLS 2311 Overview of Select Medical Careers, which provides a wide scope of information about each medical and professional career. The course is offered Fall and Spring semesters as a 2 credit hour course. Biomedical Sciences majors planning to attend medical or other health professional schools should follow the Biomedical Sciences Preprofessional Concentration.

For more information on any of the programs offered by the Burnett School of Biomedical Sciences contact the Office of Student Services and Advisement, HPA II Room 335, (407) 823-5932, bsbsadvising@ucf.edu
# Bachelor of Science in Biomedical Sciences: Pre-Professional Concentration

**Burnett School of Biomedical Sciences**

**University of Central Florida**

www.biomed.ucf.edu

**Director:** Dr. Griffith Parks, HPA II 335C  
**Associate Director:** Dr. Rosanne White, HPA II 335J  

## University Requirements

UCF General Education Program (36 hrs):  
- Communication Foundations (9 hrs): Historical & Cultural Foundations (9 hrs); Social Foundations (6 hrs);  
- Mathematical and Science Foundations (12 hrs - satisfied by major requirements).

## I. Departmental Requirements (81-90 hrs)

### A. Core Curriculum (61 hrs)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Course Code</th>
<th>Description</th>
<th>Hours</th>
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<tr>
<td>Life Sciences</td>
<td>SLS 2311C</td>
<td>Overview of Select Medical Careers</td>
<td>2 hrs</td>
</tr>
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<td></td>
<td>BSC 2010C</td>
<td>Biology I</td>
<td>4 hrs</td>
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<td>MCB 3020C</td>
<td>General Microbiology</td>
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<td>BSC 3403C</td>
<td>Quantitative Biological Methods</td>
<td>4 hrs</td>
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<tr>
<td></td>
<td>MCB 4414</td>
<td>Microbial Metabolism</td>
<td>3 hrs</td>
</tr>
<tr>
<td></td>
<td>PCB 4280, 3233L</td>
<td>Molecular Immunology + Immunology Lab</td>
<td>4 hrs</td>
</tr>
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<td></td>
<td>PCB 3522, 4524</td>
<td>Molecular Biology I, II</td>
<td>6 hrs</td>
</tr>
<tr>
<td>Chemistry</td>
<td>CHM 2045C, 2046, 2046L</td>
<td>Chemistry Fundamentals I, II + Lab</td>
<td>8 hrs</td>
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<td>BCH 4053</td>
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<td>-OR-</td>
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<td>CGS 1360C</td>
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<td>Physics for Engineers and Scientists I, II</td>
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### B. Upper Division Restricted Electives (20-29 hrs)

Students must select at least 7 courses from the list below. At least 2 courses must be laboratory courses. No more than 2 courses may be MLS courses. No more than 2 courses can be outside of the M&M Department.

*outside M&M department

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<td>ZOO 4753C Vertebrate Histology</td>
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## II. Unrestricted Electives 3000 or above (1-11 hrs)

See separate sheet for a list of these electives.
## Suggested Baccalaureate Degree Choreography
### 120 Semester Hours

**Plan your required 9 summer hours into your course of study**

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<th>Freshman Year</th>
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<tr>
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<td>ENC 1101: Composition I</td>
<td>ENC 1102: Composition II</td>
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<td>BSC 2010C: Biology I</td>
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<td>CHM 2046L: Chemistry Fundamentals Lab</td>
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<td>-OR- SYG 2000: Introduction to Sociology</td>
<td>MAC 1114C: College Trigonometry</td>
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<td>-OR- ANT 2000: General Anthropology</td>
<td>SLS 2311C: Overview of Select Medical Careers</td>
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<tr>
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<tr>
<td>CHM 2210: Organic Chemistry I</td>
<td>CHM 2211: Organic Chemistry II</td>
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<tr>
<td>MAC 2311C: Calculus with Analytic Geometry I</td>
<td>CHM 2211L: Organic Laboratory Techniques I</td>
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<tr>
<td>-OR- MAC 2253: Applied Calculus</td>
<td>STA 2023: Statistical Methods I</td>
</tr>
<tr>
<td>MCB 3020C: General Microbiology</td>
<td>-OR- CGS 1060C: Introduction to Computers</td>
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<tr>
<td>ELIH 2000: Western Civilization I</td>
<td>BSC 3403C: Quantitative Biological Methods</td>
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<tr>
<td>-OR- AMH 2010: U.S. History: 1492-1877</td>
<td>ELIH 2001: Western Civilization II</td>
</tr>
<tr>
<td>-OR- HUM 2210: Humanistic Tradition I</td>
<td>-OR- AMH 2020: U.S. History: 1877-Present</td>
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<thead>
<tr>
<th>Total Hours</th>
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<table>
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<tr>
<th>Junior Year</th>
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<td><strong>Fall</strong></td>
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<td>PCB 3522: Molecular Biology I</td>
<td>PCB 4280: Molecular Immunology</td>
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<tr>
<td>PHY 2053C: College Physics I</td>
<td>PCB 3233L: Immunology Lab</td>
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<tr>
<td>-OR- PHY 2048: Physics for Engineers I</td>
<td>PCB 4524: Molecular Biology II</td>
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<tr>
<td>ECO 2013: Principles of Macroeconomics</td>
<td>PHY 2054C: College Physics II</td>
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<td>-OR- POS 2041: American National Government</td>
<td>-OR- PHY 2049C: Physics for Engineers II</td>
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<tr>
<td>Restricted Elective</td>
<td>Restricted Elective</td>
</tr>
<tr>
<td>BSC 2011C: Biology II</td>
<td>Recommended for Vet School</td>
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<th>Senior Year</th>
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<tbody>
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<td><strong>Spring</strong></td>
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<tr>
<td>MCB 4414: Microbial Metabolism</td>
<td>SPC 1608: Fundamentals of Oral Communication</td>
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<tr>
<td>BCH 4053: Biochemistry I</td>
<td>-OR- SPC 1603C: Fundamentals of Technical Presentations</td>
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<tr>
<td>Restricted Elective</td>
<td>Recommended</td>
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<tr>
<td>Restricted Elective</td>
<td>Restricted Elective</td>
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<tr>
<td>Cultural Historical Foundations Course</td>
<td>Restricted Elective</td>
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<thead>
<tr>
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Alternative Choreographies may be necessary as a result of transfers, course availability, or unsuccessful attempts at completing one or more courses. This should be discussed with a designated department academic advisor. Students should use unrestricted electives to meet the University requirement of 48 hours of courses of 3000 or above.

Students should consult with their designated academic advisor prior to each registration period.

For more information contact:
Office of Student Services and Advisement
HPA II 335
(407) 823-5932
BSBSadvising@ucf.edu
Bachelor of Science in Biomedical Sciences
Burnett School of Biomedical Sciences
University of Central Florida
www.biomed.ucf.edu

**Director:** Dr. Griffith Parks, HPA II 335C

**Associate Director:** Dr. Roseann White, HPA II 333J

**University Requirements**
UCF General Education Program (36 hrs):
- Communication Foundations (9 hrs); Historical & Cultural Foundations (9 hrs); Social Foundations (6 hrs);
- Mathematical and Science Foundations (12 hrs - satisfied by major requirements).

I. **Departmental Requirements (78-89 hrs)**
A. **Core Curriculum (59-60 hrs)**

<table>
<thead>
<tr>
<th>Life Sciences</th>
<th>Biology I</th>
<th>Quantitative Biological Methods</th>
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<tr>
<td>BSC 2010C</td>
<td>General Microbiology</td>
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<tr>
<td>BSC 3403C</td>
<td>Microbial Metabolism</td>
<td>3 hrs</td>
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<tr>
<td>MCB 3020C</td>
<td>Molecular Immunology + Immunology Lab</td>
<td>4 hrs</td>
<td></td>
</tr>
<tr>
<td>MCB 4414</td>
<td>Molecular Biology I, II</td>
<td>6 hrs</td>
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<tr>
<td>PCB 4280, 3233L</td>
<td>Chemistry Fundamentals I, II + Lab</td>
<td>8 hrs</td>
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</tr>
<tr>
<td>PCB 3522, 4524</td>
<td>Organic Chemistry I, II + Lab</td>
<td>8 hrs</td>
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<tr>
<td>PCB 4503</td>
<td>Biochemistry I</td>
<td>3 hrs</td>
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**Math, Statistics, and Computer Science**
| MAC 2233-OR- MAC 2311C | Applied Calculus I or Calculus I | 3-4 hrs |
| STA 2023-OR- CGS 1060C | *Prerequisites: MAC 1105C, MAC 1114C, and MAC 1140C | |

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<tr>
<th>Physics</th>
<th>Chemistry Fundamentals I, II + Lab</th>
<th>8 hrs</th>
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</thead>
<tbody>
<tr>
<td>PHY 2053C, 2054C</td>
<td>Introduction to Computers</td>
<td>3 hrs</td>
</tr>
<tr>
<td>PHY 2048C, 2049C</td>
<td>College Physics I, II</td>
<td>8 hrs</td>
</tr>
</tbody>
</table>

B. **Upper Division Restricted Electives (19-29 hrs)**

Students must select at least 7 courses from the list below. At least 2 courses must be laboratory courses. No more than 2 courses may be M&I courses. No more than 2 courses can be outside the M&M Department.

**outside M&M department, **recommended for pre-professional students

| BCH 4504 Biochemistry II/*/** | PCB 3063 Genetics/*/** | 3 hrs |
| BCH 4103L Biochemical Methods* | PCB 3703C Human Physiology/* | 3 hrs |
| BOT 4434C General Mycology | PCB 4028 Molecular and Cellular Pharmacology/* | 3 hrs |
| BSC 3424 Nanobiotechnology | PCB 4135 Applied Molecular Cell Biology | 3 hrs |
| BSC 4434 Biomedical Informatics: Sequence Analysis | PCB 4171 Foundation of Bio-Imaging Science | 3 hrs |
| BSC 4439 Biomedical Informatics: Structure Analysis | PCB 4234 Cancer Biology/* | 3 hrs |
| MCB 3202 Principles of Infectious Disease/* | PCB 4264 Stem Cell Biology | 3 hrs |
| MCB 3203, 3203L Pathogenic Microbiology + Lab | PCB 4284 Immunobiology | 3 hrs |
| MCB 4201 Microbial Stress Response | PCB 4514 Genetics II/*/* | 3 hrs |
| MCB 4204 Cell Microbiology: Host-Pathogen Interactions | PCB 4521 Tissue Engineering | 3 hrs |
| MCB 4207 Infectious Processes/*/* | PCB 4529C Experimental Molecular Cell Biology | 3 hrs |
| MCB 4276 Epidemiology of Infectious Diseases/*/* | PCB 4663 Human Genetics | 3 hrs |
| MCB 4312 Molecular Biotechnology/*/* | PCB 4708L Lab Virtual Simulations in Physiology | 3 hrs |
| MCB 4404 Bacterial Genetics and Physiology | PCB 4805 Endocrinology/*/* | 3 hrs |
| MCB 4410 Cellular Metabolism | PCB 4813 Molecular Aspects of Obesity | 3 hrs |
| MCB 4503C Virology/*/* | PCB 4832 Cellular & Molecular Brain Functions | 3 hrs |
| MCB 4603 Environmental Microbiology | PCB 4833 Advanced Human Physiology | 3 hrs |
| MCB 4721C Methods in Biotechnology | PCB 4843 Cellular and Molecular Neuroscience | 3 hrs |
| MCB 4970H Undergraduate Honors Thesis | ZOO 3701C Dissection Techniques/*/* | 3 hrs |
| MCB 5225 Molecular Biology of Disease/*/* | ZOO 3733C Human Anatomy/*/* | 4 hrs |
| MCB 3220C Techniques in Clinical Microscopy | ZOO 3744 Neurobiology/*/* | 3 hrs |
| MCB 3305 Hematology/*/* | ZOO 3755C Introductory Histology | 4 hrs |
| MCB 4334 Hemostasis/*/* | ZOO 4603C Embryology/Development/*/** | 5 hrs |
| MCB 4430C Clinical Parasitology/*/* | ZOO 4605 Human Clinical Embryology/*/* | 3 hrs |
| MCB 4505C Immunodiagnosics/*/* | ZOO 4742 Advanced Neurobiology/*/* | 3 hrs |
| MCB 4625 Advanced Clinical Chemistry I | ZOO 4743C Clinical Neuroanatomy & Neuroscience/*/* | 4 hrs |
| MCB 4630 Advanced Clinical Chemistry II | ZOO 4747C Clinical Neuroscience/*/* | 4 hrs |
| MCB 4631 Advanced Clinical Chemistry III | ZOO 4753C Vertebrate Histology/*/* | 4 hrs |

II. **Unrestricted Electives: 3000 or above (1-11 hrs)**
See separate sheet for a list of these electives.
# Suggested Baccalaureate Degree Choreography

## 120 Semester Hours

### Freshman Year

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<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
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<tr>
<td>ENC 1101</td>
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<tr>
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<td>MAC 1105C</td>
<td>CHM 2046</td>
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<td>PSY 2012</td>
<td>CHM 2046L</td>
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<tr>
<td>OR ANT 2000</td>
<td>SLS 2311C**</td>
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**Total Hours: 13**

**Total Hours: 16**

**SLS 2311C is recommended for students pursuing any of the following fields:**

- Chiropractic
- Dental
- Medical
- Optometry
- Pharmacy
- Podiatry
- Veterinary

### Sophomore Year

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<td>OR MAC 2253</td>
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<td>MCB 3020C</td>
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<td>EUH 2000</td>
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<td>EUH 2001</td>
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<td>OR AMH 2020</td>
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**Total Hours: 14/15**

**Total Hours: 15**

**Plan your required 9 summer hours into your course of study.**

### Junior Year

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<tr>
<td>PHY 2053C</td>
<td>PCB 4524</td>
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<td>OR PHY 2048C</td>
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<td>BSC 2011C **</td>
<td>OR PHY 2049C</td>
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<td>ECO 2013</td>
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<td>OR POS 2041</td>
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**Total Hours: 17**

**Total Hours: 14/15**

**Recommended for Vet School**

### Senior Year

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<td>BCH 4053</td>
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<td>Restrict. Elective</td>
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<td>Restrict. Elective</td>
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<tr>
<td>Cultural Historical Foundations course</td>
<td>SPC 1608</td>
<td>3 hrs</td>
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<tr>
<td>OR SPC 1603C**</td>
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**Total Hours: 15/16 hrs**

**Total Hours: 12-15**

**Recommended**

Alternative Choreographies may be necessary as a result of transfers, course availability or unsuccessful attempts at completing one or more courses. This should be discussed with a designated department academic advisor. Students should use unrestricted electives to meet the University requirement of 48 hours of courses of 3000 or above.

Students should consult with their designated academic advisor prior to each registration period.

---

**For more information contact:**

Office of Student Services and Advisement

HPA II 335

(407) 823-5932

BSBSadvising@ucf.edu
## Biomedical Sciences B.S. Courses Requiring Pre-requisites

<table>
<thead>
<tr>
<th>Courses</th>
<th>Pre-requisites</th>
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<tbody>
<tr>
<td><strong>Required Courses</strong></td>
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</tr>
<tr>
<td>MAC 2253 (Applied Calculus) OR</td>
<td>“C” Grade or better in MAC 1105 (College Algebra), MAC 1140 (Pre-calculus),</td>
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<tr>
<td>MAC 2311 (Calculus I for Engineering Students)</td>
<td>and MAC 1114 (Trigonometry)</td>
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<tr>
<td>CHM 2046 (Chemistry II)</td>
<td>CHM 2045C (Chemistry I)</td>
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<tr>
<td>CHM 2210 (Organic Chemistry I)</td>
<td>“C” Grade or better in CHM 2045C (Chem I) and CHM 2046 (Chem II)</td>
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<tr>
<td>CHM 2211 (Organic Chemistry II)</td>
<td>“C” Grade or better in CHM 2210 (Organic Chemistry I)</td>
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<tr>
<td>PHY 2053C (College Physics I)</td>
<td>MAC 1114 (Trigonometry)</td>
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<tr>
<td>PHY 2054C (College Physics II)</td>
<td>PHY 2053C (College Physics I)</td>
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<td>OR</td>
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<tr>
<td>PHY 2048C (Physics for Engineers I)</td>
<td>MAC 2311 (Calculus I)</td>
</tr>
<tr>
<td>PHY 2049C (Physics for Engineers II)</td>
<td>MAC 2312 (Calculus II)</td>
</tr>
<tr>
<td>MCB 3020C (General Microbiology)</td>
<td>BSC 2010C (Biology I) and CHM 2046 (Chemistry II) and MCB 3020C (General Microbiology)</td>
</tr>
<tr>
<td>BSC 3403C (Quantitative Biological Methods)</td>
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<tr>
<td>PCB 3522 (Molecular Biology I)</td>
<td>CHM 2211 (Organic Chem II) and MCB 3020C (Gen Microbiology)</td>
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<tr>
<td>PCB 4239 (Molecular Immunology)</td>
<td>PCB 3522 (Molecular Biology I)</td>
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<tr>
<td>PCB 4524 (Molecular Biology II)</td>
<td>PCB 3522 (Molecular Biology I)</td>
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<tr>
<td>BCH 4053 (Biochemistry I)</td>
<td>“C” Grade or better in CHM 2210 (Organic Chemistry I) and CHM 2211 (Organic Chemistry II)</td>
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<tr>
<td>MCB 4414 (Microbial Metabolism)</td>
<td>BSC 3403C (Quantitative Biological Methods)</td>
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<tr>
<td><strong>Some Restricted Electives</strong></td>
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<tr>
<td>BOT 4434C (General Mycology)</td>
<td>BSC 2011 (Biology II) OR MCB 3020C (General Microbiology)</td>
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<tr>
<td>MCB 3203 (Pathogenic Microbiology)</td>
<td>MCB 3020C (General Microbiology)</td>
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<tr>
<td>MCB 3203L (Pathogenic Microbiology Lab)</td>
<td>MCB 3020C (Gen Micro) and CR: MCB 3203 (Pathogenic Microbiol)</td>
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<tr>
<td>MCB 4201 (Microbial Stress Response)</td>
<td>MCB 3020C (General Microbiology)</td>
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<tr>
<td>MCB 4276 (Epidemiology of Infectious Diseases)</td>
<td>MCB 3020C (General Microbiology)</td>
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<tr>
<td>MCB 4404 (Bacterial Genetics and Physiology)</td>
<td>MCB 3020C (General Microbiology)</td>
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<td>MCB 4410 (Cellular Metabolism)</td>
<td>PCB 3522 (Molecular Biology I)</td>
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<tr>
<td>MLS 3305 (Hematology)</td>
<td>PCB 3522 (Molecular Biology I) OR PCB 3023 (Molec Cell Biology)</td>
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<tr>
<td>MLS 4334 (Hemostasis)</td>
<td>CHM 2210 (Organic Chemistry I) and PCB 3703C (Human Physio)</td>
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<tr>
<td>MLS 4625 (Advanced Clinical Chemistry I)</td>
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<tr>
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<tr>
<td>PCB 3063 (Genetics)</td>
<td>BSC 2010C (Biology I), CHM 2045C (Chemistry I), and CHM 2046 (Chemistry II) OR CI (Consent of Instructor)</td>
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<tr>
<td>PCB 3703C (Human Physiology)</td>
<td>BSC 2010C (Biology I) and CHM 2045C (Chemistry I)</td>
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<tr>
<td>PCB 4028 (Molecular &amp; Cellular Pharmacology)</td>
<td>PCB 3522 (Molecular Biology I)</td>
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<td>PCB 4174 (Foundation of Bio-Imaging Science)</td>
<td>CHM 2210 (Organic Chemistry I), MAC 2311 (Calculus I), and PHY 2054C (College Physics II)</td>
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<tr>
<td>PCB 4234 (Cancer Biology)</td>
<td>PCB 3522 (Molecular Biology I) OR PCB 3023 (Molec Cell Biology)</td>
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<td>PCB 4521 (Tissue Engineering)</td>
<td>CHM 2045C (Chemistry I) OR MCB 3020C (General Microbiology)</td>
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<tr>
<td>PCB 4805 (Endocrinology)</td>
<td>CHM 2211 (Organic Chemistry II) and PCB 3703C (Human Physio)</td>
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<tr>
<td>PCB 4832 (Cell &amp; Molecular Basis of Brain Functions)</td>
<td>PCB 3703C (Human Physiology) and ZOO 3733C (Human Anatomy)</td>
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<td>PCB 4833 (Advanced Human Physiology)</td>
<td>PCB 3703C (Human Physiology) and ZOO 3733C (Human Anatomy)</td>
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<tr>
<td>ZOO 3701C (Gross Anatomy Dissection Techniques)</td>
<td>ZOO 3733C (Human Anatomy)</td>
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<td>ZOO 3733C (Human Anatomy)</td>
<td>BSC 2010C (Biology I)</td>
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<td>ZOO 3744 (Neurobiology)</td>
<td>BSC 2010C (Biology I)</td>
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<tr>
<td>ZOO 3755C (Introduction to Histology)</td>
<td>PCB 3703C (Human Physiology) and ZOO 3733C (Human Anatomy)</td>
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<td>ZOO 4605 (Clinical Embryology)</td>
<td>ZOO 3733C (Human Anatomy)</td>
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<tr>
<td>ZOO 4743C (Clinical Neuroanatomy &amp; Neuroscience)</td>
<td>“B” Grade or better in ZOO 3733C (Human Anatomy)</td>
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<tr>
<td>ZOO 4753C (Vertebrate Histology)</td>
<td>ZOO 3733C (Human Anatomy)</td>
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## Department of Molecular Biology and Microbiology

### Name:

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<th>Fall</th>
<th>Course</th>
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Prepared By: Cynthia Contreras
Override Procedure for M&M Courses

**The department of Molecular Biology and Microbiology only handles overrides for courses offered by the Burnett School of Biomedical Sciences**
(BSC 3403C, MCB 3020, MCB 4414, PCB 3703C, PCB 4524, ZOO 3733C, etc.)

- Attempt to register for the course through http://my.ucf.edu. If this registration is not successful, make sure to note the error that is indicated in the error log accompanying the notice of unsuccessful registration.

- Obtain an override form from HPA II 335 or online at biomed.ucf.edu.

- Students **MUST** bring one of the following:
  - A degree audit
  - A copy of their official or unofficial transcript

- Students **MUST** also bring:
  - The exact class number (ex: 52230)
  - The subject prefix and catalog number (ex: MCB 3020)
  - The lab class number, prefix, and catalog number (if needed)

- For students taking prerequisites at another University or Community College, they must show proof that they are taking these courses at that institution (class schedule, transient form, transcript, etc.).

**Note that there are no overrides into closed courses**

- **BIOLOGY OVERRIDES:**
  (BSC 2010C, BSC 2011C, PCB 3063)
  BIO 301
  TEL: (407) 823-2141

- **CHEMISTRY OVERRIDES:**
  (CHM 1032, CHM 2045C, CHM 2046, CHM 2210, CHM 2211, BCH 4053)
  PSB 255
  TEL: 407-823-2246

- **PHYSICS OVERRIDES:**
  (PHY 2053C, PHY 2054C, PHY 2048)
  PSB 430
  TEL: 407-823-2325

- **MATH OVERRIDES:**
  (MAC 1105, MAC 1114, MAC 1140, MAC 2311)
  MSB 207
  TEL: (407) 823-6284

- **GENERAL EDUCATION:** Handled by department offering course needed.
Office of Student Services and Advisement
Burnett School of Biomedical Sciences (BSBS)
http://www.biomed.ucf.edu

Office Hours: (subject to change weekly)
Monday – Friday, 8:30am – 12:00pm & 1:00pm – 4:00pm

Location: HPA II, Room 335

Office of Student Services and Advisement:
- Phone: (407)-823-5932
- Email: BSBSadvising@ucf.edu
- Appointments Only: HPA II, Room 335
  - Email advisors directly or use email above if you do not have a preference

Advisors:
- Cynthia Contreras: cynthia.contreras@ucf.edu
- Ana Maria Schwindt: ana.schwindt@ucf.edu

Majors in BSBS:
- BS in Biomedical Sciences
- BS in Biotechnology
- BS in Medical Laboratory Sciences