The Bachelor of Science in Microbiology and Cell Science offers a flexible curriculum that develops an excellent knowledge base and an understanding of concepts in microbiology, cell biology and the biochemical sciences. Emphasis is placed on application of the scientific method to gain an understanding of the biological world at the cellular and molecular levels. Students learn to evaluate hypotheses, interpret experimental data, and communicate results effectively.

### About this Program

- **College:** Agricultural and Life Sciences (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL)
- **Degree:** Bachelor of Science
- **Credits for Degree:** 120
- **Contact:** 1.855.99GATOR
- **More Info:**

To graduate with this major, students must complete all university, college, and major requirements.

### Department Information

The Department of Microbiology and Cell Science is committed to excellence in education, research and service to the community. The curriculum provides an excellent preparation for students who wish to enter the workforce or continue their education in professional programs such as medical, dental, pharmacy, veterinary programs, graduate school or public health degrees. B.S. degrees are offered through both the College of Agricultural and Life Sciences and the College of Liberal Arts and Sciences and the M.S. and Ph.D. degrees are offered through the College of Agricultural and Life Sciences. Combination degrees are available.

**Website** (http://microcell.ufl.edu)

**CONTACT**

Email (bkorithoski@ufl.edu) | 352.392.1906 (tel) | 352.846.0950 (fax)

P.O. Box 110700
1355 Museum Drive
MICROBIOLOGY AND CELL SCIENCE BUILDING (MCSB)
GAINESVILLE FL 32611-0700

Map (http://campusmap.ufl.edu/#/index/0981)

### Curriculum

- Bioinformatics Minor
- Combination Degrees
- Microbiology and Cell Science UF Online
- Microbiology and Cell Sciences | CALS
- Microbiology and Cell Sciences | CLAS
- Pathogenesis Minor

This major prepares students for entry into professional programs in medicine, dentistry and veterinary medicine and provides a strong foundation for graduate studies in microbiology, cell biology and related cellular and biomedical sciences. The major also provides a background for entry into government, industrial research and diagnostic laboratories.

The curriculum develops fundamental knowledge of prokaryotic and eukaryotic cells and viruses. Courses include the physiology and genetics of microorganisms, mechanisms of pathogenesis and innate immunity systems, astrobiology, bacterial and genome sequencing and bioinformatics.

### Coursework for the Major

All majors must take 28-29 credits: 15 credits are core requirements, 10 credits are upper-division department electives and 3-4 credits are the quantitative requirement. A minimum of one credit in an advanced laboratory is required as part of the 10 department-elective credits.

Minimum grades of C, attained within two attempts (including withdrawals), are required in all critical-tracking courses, major courses, department core requirements, department electives and the quantitative requirement. Second attempts must be completed the next semester of enrollment. A 2.0 cumulative GPA of also is required.

### Core Requirements

#### BSC 2010
- Integrated Principles of Biology 1
- and Integrated Principles of Biology Laboratory 1 1

#### BSC 2011
- Integrated Principles of Biology 2
- and Integrated Principles of Biology Laboratory 2 1

#### CHM 2045
- General Chemistry 1
- and General Chemistry 1 Laboratory 1

#### CHM 2046
- General Chemistry 2
- and General Chemistry 2 Laboratory 1

#### MAC 2311
- Analytic Geometry and Calculus 1 1
- Select one:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>PHY 2053</td>
<td>Physics 1</td>
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& 2053L | and Laboratory for Physics 1 | 4 |
| PHY 2054 | Physics 2 | 4 |
& 2054L | and Laboratory for Physics 2 | 4 |

#### Option Two

<table>
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<tbody>
<tr>
<td>PHY 2048</td>
<td>Physics with Calculus 1</td>
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& 2048L | and Laboratory for Physics with Calculus 1 | 5 |
| PHY 2049 | Physics with Calculus 2 | 5 |
& 2049L | and Laboratory for Physics with Calculus 2 | 5 |

#### CHM 2210
- Organic Chemistry 1 2
- 3

#### CHM 2211
- Organic Chemistry 2
- 5

#### & 2211L
- and Organic Chemistry Laboratory

### Department Elective Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>MCB 4304</td>
<td>Genetics of Microorganisms (offered fall)</td>
<td>1</td>
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<tr>
<td>MCB 4934</td>
<td>Special Topics in Microbiology and Cell Science 4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCB 4034L</td>
<td>Advanced Microbiology Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

Select three:
to determine their eligibility for this program.

A Bachelor of Science and Master of Science (non-thesis) program is offered by the College of Agricultural and Life Sciences. Microbiology majors in both the College of Agricultural and Life Sciences and the College of Liberal Arts and Sciences are eligible for admission to the combination degree program. Students should email for an appointment to determine their eligibility for this program.

**Combination Degree Program**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CHM 3218</td>
<td>Organic Chemistry/Biochemistry 2 (biochemistry requirement)</td>
<td>4</td>
</tr>
<tr>
<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>STA 2023</td>
<td>Introduction to Statistics 1</td>
<td>3</td>
</tr>
<tr>
<td>MCB 4403</td>
<td>Prokaryotic Cell Structure and Function (required department elective)</td>
<td>3</td>
</tr>
<tr>
<td>PCB 3134</td>
<td>Eukaryotic Cell Structure and Function (required department elective)</td>
<td>3</td>
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<tr>
<td>CHM 3400</td>
<td>Physical Chemistry for the Biosciences (required department elective)</td>
<td>3</td>
</tr>
<tr>
<td>MCB 5305L</td>
<td>Microbial Genetics and Biotechnology Laboratory (microbiology advanced laboratory requirement)</td>
<td>2</td>
</tr>
<tr>
<td>PCB 4233</td>
<td>Immunology (pathogens or immunology requirement)</td>
<td>3</td>
</tr>
<tr>
<td>MCB 4905</td>
<td>Independent Study (valuable laboratory research experience)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>29</strong></td>
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**Relevant Minors and/or Certificates**

The Department of Microbiology and Cell Science also offers a minor in bioinformatics to students majoring in any life sciences subject, including and not limited to microbiology, biology or biochemistry.

So integrated is bioinformatics with the life sciences that it is difficult to find an active research program that does not rely on bioinformatic analysis to achieve results. By integrating bioinformatic and traditional methods, the minor in bioinformatics provides critical training to future professionals in the life science disciplines.

**Critical Tracking**

Critical Tracking records each student’s progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites (http://www.flvc.org/cpp/displayRecord.jsp?cip=260503&track=01) may be used for transfer students.

**Semester 1**

- Complete CHM 1025 or CHM 2045/CHM 2045L
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required
Semester 2
• Complete CHM 2045/CHM 2045L and BSC 2010/BSC 2010L
• 2.5 GPA required for all critical-tracking courses
• 2.0 UF GPA required

Semester 3
• Complete CHM 2046/CHM 2046L and MAC 2311
• 2.5 GPA required for all critical-tracking courses
• 2.0 UF GPA required

Semester 4
• Complete CHM 2210
• 2.5 GPA required for all critical-tracking courses
• 2.0 UF GPA required

Semester 5
• Complete MCB 3023
• 2.0 Upper division GPA required

Semester 6
• Complete MCB 4034L
• 2.0 Upper division GPA required

Semester 7
• Complete MCB 4203 (Fall) or PCB 4233 (Spring) or PCB 3134 (fall/spring) or MCB 4403 (Fall)
• 2.0 Upper division GPA required

Semester 8
• Complete MCB 4043L
• 2.0 Upper division GPA required

Model Semester Plan
To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student’s academic record and scheduling availability of courses. Prerequisites still apply.

<table>
<thead>
<tr>
<th>Course Semester One</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BSC 2010 &amp; 2010L</td>
<td>Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1 (Critical Tracking; Gen Ed Biological Sciences)</td>
<td>4</td>
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<tr>
<td>CHM 2045 &amp; 2045L</td>
<td>General Chemistry 1 and General Chemistry 1 Laboratory (Critical Tracking; State Core Gen Ed Biological and Physical Sciences)</td>
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</table>

Quest 1 (Gen Ed Humanities) 3

| State Core Gen Ed Composition (Writing Requirement) | 3 |

Semester Two
Select one:
- AEB 2014 Economic Issues, Food and You
- ECO 2013 Principles of Macroeconomics
- ECO 2023 Principles of Microeconomics (Gen Ed Social and Behavioral Sciences)

BSC 2011 & 2011L Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2 (Critical Tracking; Gen Ed Biological Sciences)

CHM 2046 General Chemistry 2 and General Chemistry 2 Laboratory (Critical Tracking; Gen Ed Physical Sciences)

State Core Gen Ed Humanities (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext) 3

<table>
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Semester Three

| CHM 2210 Organic Chemistry 1 (Critical Tracking) | 3 |
| MAC 2311 Analytic Geometry and Calculus 1 (Critical Tracking; State Core Gen Ed Mathematics) | 4 |

Select one:
- PHY 2053 Physics 1 & 2053L and Laboratory for Physics 1
- PHY 2048 Physics with Calculus 1 & 2048L and Laboratory for Physics with Calculus 1

State Core Gen Ed Social and Behavioral Sciences (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext) 3

<table>
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<th>Credits</th>
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Semester Four

| AEC 3033C Research and Business Writing in Agricultural and Life Sciences (Writing Requirement) | 3 |
| ENC 2210 Technical Writing (Writing Requirement) | 3 |

Select one:
- CHM 2211 Organic Chemistry 2 & 2211L and Organic Chemistry Laboratory & MCB 4934 and Special Topics in Microbiology and Cell Science
- MCB 3023 Principles of Microbiology & MCB 3015C and Lab Skills Bootcamp & MCB 4934 and Special Topics in Microbiology and Cell Science (Critical Tracking)

Gen Ed Composition (Writing Requirement) 3

<table>
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Semester Five

| BCH 4024 or CHM 3218 Introduction to Biochemistry and Molecular Biology or Organic Chemistry/Biochemistry 2 | 4 |

Select one:
- PHY 2054 Physics 2 & 2054L and Laboratory for Physics 2
- PHY 2049 Physics with Calculus 2 & 2049L and Laboratory for Physics with Calculus 2
- SPC 2608 Introduction to Public Speaking

Gen Ed Diversity 3

<table>
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Semester Six

| PCB 4522 Molecular Genetics | 3 |

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</table>

STA 2023  Introduction to Statistics 1 (Gen Ed Mathematics)  3
Department elective  3
International elective  3
Elective  3

Credits  15

Semester Seven
MCB 4203  Bacterial Pathogens (Critical Tracking)  3
Departmental electives  6
Writing Requirement  3
Elective  1
Elective (3000 level or above)  3

Credits  16

Semester Eight
MCB 4034L  Advanced Microbiology Laboratory (Critical Tracking)  1
Electives  15

Credits  16

Total Credits  120

1 ENC 1101 recommended.

Academic Learning Compact
The Bachelor of Science in microbiology and cell science, offered by both the College of Agricultural and Life Sciences and the College of Liberal Arts and Sciences, offers students flexibility in a curriculum that develops an excellent knowledge base and an understanding of concepts in microbiology, cell biology and the biomolecular sciences. Emphasis will be placed on application of the scientific method to gain an understanding of the biological world at the cellular and molecular levels. Students will learn to evaluate hypotheses, to interpret experimental data and to communicate results effectively.

Before Graduating Students Must
Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major will Learn to
Student Learning Outcomes (SLOs)

Content
1. Describe fundamental concepts, skills and processes in microbiology, molecular biology and in host/pathogen interactions.
2. Apply fundamental concepts, skills and protocols used to conduct research in fields of microbiology, molecular biology and in host/pathogen.

Critical Thinking
3. Evaluate information and data in the general areas of microbiology and the cellular and molecular biological sciences.
4. Solve typical problems that are encountered in general areas of microbiology and cellular and molecular biological sciences.

Communication
5. Communicate effectively in written form in a manner appropriate in microbiology and the cellular and molecular biological sciences.
6. Communicate orally (including visual aids) in an effective manner appropriate in microbiology and the cellular and molecular biological sciences.

Curriculum Map
I = Introduced; R = Reinforced; A = Assessed

<table>
<thead>
<tr>
<th>Courses</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
<th>SLO 4</th>
<th>SLO 5</th>
<th>SLO 6</th>
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<tr>
<td>PCB 4233</td>
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<td>R, A</td>
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<tr>
<td>or PCB 4522</td>
<td>I, R</td>
<td>R, A</td>
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Assessment Types
- Genome and lab projects
- Presentations
- Exams
- Final grades