Bachelor of Arts in Microbiology

Microbiology
Microbiology is the study of bacteria, viruses, the immune system, and their roles in human health, the environment and beyond. Job prospects for microbiologists with a bachelor's or higher degree continue to be strong. Upper-division courses in immunology, bacterial infectious diseases, virology, and microbial genetics couple laboratory courses with lecture courses to provide students with hands-on practical experience. The B.A. Microbiology major includes a choice of three upper-division lecture and laboratory course pairs.

Undergraduate Admission
Admission to KU
All students applying for admission must send high school and college transcripts to the Office of Admissions. Unless they are college transfer students with at least 24 hours of credit, prospective students must send ACT or SAT scores to the Office of Admissions. Prospective first-year students should be aware that KU has qualified admission requirements that all new first-year students must meet to be admitted. Consult the Office of Admissions (http://admissions.ku.edu/) for application deadlines and specific admission requirements.

Visit the International Support Services (http://www.iss.ku.edu/) for information about international admissions.

Students considering transferring to KU may see how their college-level course work will transfer on the Office of Admissions (http://credittransfer.ku.edu/) website.

Admission to the College of Liberal Arts and Sciences
Admission to the College is a different process from admission to a major field. Some CLAS departments have admission requirements. See individual department/program sections for departmental admission requirements.

First- and Second-Year Preparation
Because biology study requires preparation in other sciences, students should begin meeting major requirements in the first year. It is particularly important to take CHEM 130 and CHEM 135 in the first year and, for several majors, to take CHEM 330, CHEM 331, CHEM 335, and CHEM 336 in the second year. Ideally, most majors should also take BIOL 150 and BIOL 152 during the first year, as well as BIOL 105.

Requirements for the B.A. Major in Microbiology
In addition to degree and major requirements for all plans and subplans, all students must complete the KU Core.

General Science Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 105</td>
<td>Biology Orientation Seminar</td>
<td>4</td>
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</tbody>
</table>

Principles of Molecular & Cellular Biology. Satisfied by one of the following:
- BIOL 150 Principles of Molecular and Cellular Biology
- BIOL 151 Principles of Molecular and Cellular Biology, Honors

Principles of Organismal Biology. Satisfied by one of the following:
- BIOL 152 Principles of Organismal Biology
- BIOL 153 Principles of Organismal Biology, Honors

Principles of Genetics. Satisfied by one of the following:
- BIOL 350 Principles of Genetics

Biochemistry. Satisfied by one of the following:
- BIOL 600 Introductory Biochemistry, Lectures

BIOL 636 Biochemistry I & BIOL 638 Biochemistry II

Chemistry I. Satisfied by one of the following:
- CHEM 130 General Chemistry I
- CHEM 190 Foundations of Chemistry I, Honors
- & CHEM 191 and Foundations of Chemistry I Laboratory, Honors

Chemistry II. Satisfied by one of the following:
- CHEM 135 General Chemistry II
- CHEM 195 Foundations of Chemistry II, Honors
- & CHEM 196 and Foundations of Chemistry II Laboratory, Honors

Organic Chemistry I. Satisfied by one of the following:
- CHEM 310 Fundamentals of Organic Chemistry
- CHEM 330 Organic Chemistry I

Organic Chemistry I Laboratory. Satisfied by:
- CHEM 331 Organic Chemistry I Laboratory

Calculus. Satisfied by one of the following:
- MATH 115 Calculus I
- & MATH 116 and Calculus II
- MATH 125 Calculus I
- MATH 145 Calculus I, Honors

Physics I. Satisfied by one of the following:
- PHSX 114 College Physics I
- PHSX 211 General Physics I
- & PHSX 216 and General Physics I Laboratory
- PHSX 213 General Physics I Honors

Physics II. Satisfied by one of the following:
- PHSX 115 College Physics II
- PHSX 212 General Physics II
- & PHSX 236 and General Physics II Laboratory
- PHSX 214 General Physics II Honors

Microbiology Core Knowledge & Skills
Fundamentals of Microbiology. Satisfied by one of the following:
- BIOL 400 Fundamentals of Microbiology
- BIOL 401 Fundamentals of Microbiology, Honors

Fundamentals of Microbiology Laboratory. Satisfied by:
- BIOL 402 Fundamentals of Microbiology Laboratory

Senior Seminar: Current Progress in Microbiology. Satisfied by:

Microbiology Electives and Laboratory Requirements
This degree plan assumes students will have the equivalent of MATH 101 or MATH 104, or equivalent prior to the freshman year, fall semester.

**Freshman**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101 (Goal 2.1 (2 crs req), BA Writing I)(^1)</td>
<td>3</td>
<td>ENGL 102 (Goal 1.2 (2 crs req), BA Writing II)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 115 (Goal 1.2 Quantitative Reasoning, BA Quant Req, General Science Req)(^2)</td>
<td>3</td>
<td>MATH 116 (General Science Requirement)</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 130 (Goal 3 Natural Science, General Science Requirement)(^3)</td>
<td>5</td>
<td>CHEM 135 (General Science Requirement)</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 150 or 151 (BA Lab Science, General Science Requirement)(^4)</td>
<td>4</td>
<td>BIOL 152 or 153 (General Science Requirement)</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 105 (General Science Requirement)</td>
<td>1</td>
<td></td>
<td></td>
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</table>

**Sophomore**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Semester Language (BA Second Language)</td>
<td>5</td>
<td>2nd Semester Language (BA Second Language)</td>
<td>5</td>
</tr>
<tr>
<td>BIOL 400 or 401 (Major Requirement)(^6)</td>
<td>3-4</td>
<td>Goal 3 Social Science</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 402 (Major Requirement)(^6)</td>
<td>2</td>
<td>BIOL 350 (General Science Requirement)</td>
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<tr>
<td>CHEM 310 or 330 (General Science Requirement)(^7)</td>
<td>3</td>
<td>PHSX 114 (or PHSX 211 &amp; 216 (Goal 1.1 Critical Thinking, General Science Requirement))</td>
<td>4-5</td>
</tr>
<tr>
<td>CHEM 331 (General Science Requirement)</td>
<td>2</td>
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<td></td>
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</table>

**Junior**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd Semester Language (BA Second Language)</td>
<td>3</td>
<td>4th Semester Language, or 1st semester of Another Language (BA Second Language)</td>
<td>3-5</td>
</tr>
<tr>
<td>Goal 4.1 U.S. Diversity</td>
<td>3</td>
<td>BIOL 600 or 638 and 638 (General Science Requirement)(^10)</td>
<td>3</td>
</tr>
<tr>
<td>PHSX 115 (or PHSX 212 &amp; 236 (General Science Requirement))</td>
<td>4</td>
<td>Microbiology Elective 400+ (Major Requirement)(^5, 6, 8)</td>
<td>3</td>
</tr>
<tr>
<td>Microbiology Elective 400+ (Major Requirement)(^5, 6, 8)</td>
<td>3</td>
<td>Microbiology Lab Elective 400+ (Major Requirement)(^5, 6, 8)</td>
<td>2</td>
</tr>
<tr>
<td>Microbiology Lab Elective 400+ (Major Requirement)(^5, 6, 8)</td>
<td>2</td>
<td>Elective or possible minor course 300+ (Total Hours)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Senior**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 4.2 Global Awareness</td>
<td>3</td>
<td>Goal 2.2 Communication</td>
<td>3</td>
</tr>
<tr>
<td>Microbiology Elective 400+ (Major Requirement)(^5, 6, 8)</td>
<td>3</td>
<td>Goal 3 Humanities</td>
<td>3</td>
</tr>
<tr>
<td>Microbiology Lab Elective 400+ (Major Requirement)(^5, 6, 8)</td>
<td>2</td>
<td>Goal 5 Social Responsibility &amp; Ethics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL Elective 400+ (Major Requirement)(^9)</td>
<td>3</td>
<td>Elective or possible minor course 300+ (Total Hours)</td>
<td>3</td>
</tr>
<tr>
<td>Elective or possible minor course 300+ (Total Hours)</td>
<td>3</td>
<td>Elective or possible minor course 300+ (Total Hours)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Hours 120-124**

1 The BA requires completion of two courses of collegiate-level writing instruction. Students who test out of Composition will still need to complete ENGL 102 (or equivalent) and one additional Goal 2.1 course.

2 Requires a Math ACT score of 26+, a comparable SAT or KU Math Placement Exam score, or credit for a MATH 101 or MATH 104 equivalent course. MATH 125 can be taken instead of MATH 115 and MATH 116 to fulfill the Math requirement.
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3 MATH 115 eligibility is required for enrollment.
4 Concurrent or prior enrollment in CHEM 130 is required.
5 BIOL 506, BIOL 507, BIOL 512, and BIOL 513 are offered only in the spring.
6 BIOL 400/Biol 401, BIOL 402, BIOL 503, BIOL 504, BIOL 518, and BIOL 519 are offered only in the fall.
7 BIOL 400/Biol 401, BIOL 402, BIOL 503, BIOL 504, BIOL 512, BIOL 513, BIOL 518, and BIOL 519.
8 Most medical schools require the full CHEM 330, CHEM 331, CHEM 335, and CHEM 336 sequence.
9 15 hours of Microbiology courses, including 3 lecture-lab pairings, selected from BIOL 503, BIOL 504, BIOL 506, BIOL 507, BIOL 512, BIOL 513, BIOL 518, and BIOL 519.
10 3 hours of BIOL course(s) 400+ selected in consultation with a Microbiology advisor.
11 BIOL 600 (3 hours) or BIOL 636 and BIOL 638 (8 hours) required. BIOL 636 is offered only in the fall semester, BIOL 638 is offered only in the spring semester, and BIOL 600 is offered in both the fall and spring semesters.

Visit this website (https://collegeadvising.ku.edu/sites/collegeadvising.ku.edu/files/docs/BA Quantitative Reasoning.pdf) for a list of courses that fulfill the BA Quantitative Reasoning requirement.

* BIOL 105: Biology Orientation Seminar (1 hour online course) is required for the major. It can be taken the summer prior to your freshman year.

Please note:

Students may earn degrees in more than one major within biological sciences, or in a biological science and an area outside biology by meeting the requirements of both degree programs and taking at least 15 hours of courses unique to each major.

All students in the College of Liberal Arts and Sciences are required to complete 120 total hours of which 45 hours must be at the Jr/Sr (300+) level.

The same course cannot be used to fulfill more than one KU Core Goal. However, overlap of a KU Core course with a major or degree-specific requirement is allowed. Overlapping is recommended to allow more opportunities to explore other majors and/or minors.

Departmental Honors

Undergraduate majors are eligible to graduate with honors in biology if they fulfill the following requirements:

1. Complete all course work required for the appropriate degree in biology.
2. Achieve a minimum grade-point average of 3.5 in the major.
3. Complete BIOL 499 Introduction to Honors Research with a grade of B or higher.
4. Complete BIOL 699 Biology Honors Research Colloquium with a grade of B or higher.
5. Complete an independent research project under the supervision of a faculty member in an area appropriate to the degree sought.
6. Submit an honors thesis to the honors committee once the research is complete and present the results of the completed research at the honors research symposium.

Students majoring in Human Biology with Anthropology, Applied Behavioral Science, Psychology, or Speech-Language-Hearing concentrations will follow the honors requirements for their respective concentration department.

Specific guidelines and intent forms are available in the Undergraduate Biology Program office and online (http://www.kuub.ku.edu/). Candidates must declare their intent to graduate with honors at least 2 semesters before graduation.

Study Abroad

Consult an advisor at least 4 months before undertaking study abroad. Consult the Office of Study Abroad (http://www.studyabroad.ku.edu/), 108 Lippincott Hall, for information about study in one of the many countries (e.g., Scotland, Australia, Switzerland) with special arrangements with KU.