Bachelor of Science 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.S. Microbiology major includes all four of the 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.S. Degree in Microbiology
In addition to degree and major requirements, all students must complete the KU Core.

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>General Science Requirements</td>
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<td>Majors must complete 51-55 hours of the following general science requirements that serve as foundational courses for this major.</td>
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Bachelor of Science in Microbiology

BIOL 105  Biology Orientation Seminar  1
Molecular & Cellular Biology. Satisfied by one of the following:  4
BIOL 150  Principles of Molecular and Cellular Biology  4
BIOL 151  Principles of Molecular and Cellular Biology, Honors  4
Principles of Genetics. Satisfied by one of the following:  4
BIOL 350  Principles of Genetics  4
BIOL 360  Principles of Genetics, Honors  4
Statistics. Satisfied by one of the following:  3-4
BIOL 570  Introduction to Biostatistics  3-4
MATH 365  Elementary Statistics  3-4
PSYC 210  Statistics in Psychological Research  3-4

Biochemistry I. Satisfied by:
BIOL 636  Biochemistry I  4
Biochemistry II. Satisfied by:
BIOL 638  Biochemistry II  3
Chemistry I. Satisfied by one of the following:  5
CHEM 130  General Chemistry I  5
CHEM 190  Foundations of Chemistry I, Honors  5
& CHEM 191  Foundations of Chemistry I Laboratory, Honors  5
Chemistry II. Satisfied by one of the following:  5
CHEM 135  General Chemistry II  5
CHEM 195  Foundations of Chemistry II, Honors  5
& CHEM 196  Foundations of Chemistry II Laboratory, Honors  5
Organic Chemistry I. Satisfied by one of the following:  3
CHEM 330  Organic Chemistry I  3
CHEM 380  Organic Chemistry I, Honors  3
Organic Chemistry I Laboratory. Satisfied by:
CHEM 331  Organic Chemistry I Laboratory  2
Organic Chemistry II. Satisfied by one of the following:  3
CHEM 335  Organic Chemistry II  3
CHEM 385  Organic Chemistry II, Honors  3
Organic Chemistry II Laboratory. Satisfied by:
CHEM 336  Organic Chemistry II Laboratory  2
Calculus. Satisfied by one of the following:  4-6
MATH 115  Calculus I  4-6
& MATH 116  and Calculus II  4-6
MATH 125  Calculus I  4-6
Physics. Satisfied by one of the following:  8-9
Option 1: College Physics
PHSX 114  College Physics I  8-9
& PHSX 115  and College Physics II  8-9
Option 2: General Physics
PHSX 211  General Physics I  8-9
& PHSX 216  and General Physics I Laboratory  8-9
PHSX 212  General Physics II  8-9
& PHSX 236  and General Physics II Laboratory  8-9

Microbiology Course Requirements
Satisfied by completing 29-30 hours from the following courses:
Fundamentals of Microbiology. Satisfied by one of the following:  3-4
BIOL 400  Fundamentals of Microbiology  3-4
Bachelor of Science in Microbiology

BIOL 401  Fundamentals of Microbiology, Honors
Fundamentals of Microbiology Laboratory. Satisfied by:
BIOL 402  Fundamentals of Microbiology Laboratory 2
Cell Structure & Function. Satisfied by one of the following:
BIOL 416  Cell Structure & Function 3
or BIOL 536  Cell Structure and Function (Honors)
Immunology. Satisfied by:
BIOL 503  Immunology 3
Immunology Laboratory. Satisfied by:
BIOL 504  Immunology Laboratory 2
Bacterial Infectious Diseases. Satisfied by:
BIOL 506  Bacterial Infectious Diseases 3
Bacterial Infectious Diseases Laboratory. Satisfied by:
BIOL 507  Bacterial Infectious Diseases Laboratory 2
General Virology. Satisfied by:
BIOL 512  General Virology 3
Virology Laboratory. Satisfied by:
BIOL 513  Virology Laboratory 2
Microbial Genetics. Satisfied by:
BIOL 518  Microbial Genetics 3
Microbial Genetics Laboratory. Satisfied by:
BIOL 519  Microbial Genetics Laboratory 2
Senior Seminar - Current Progress in Microbiology. Satisfied by:
BIOL 599  Senior Seminar: _____ (Must be taken in senior year) 1
Microbiology Required Electives
Satisfied by completing 6 hours of BIOL courses numbered 400 or higher, which must be selected in consultation with a microbiology advisor.

Major Hours & Major GPA

While completing all required courses, majors must also meet each of the following hour and grade-point average minimum standards:

Major Hours
Satisfied by 35-36 hours of major courses.

Major Hours in Residence
Satisfied by a minimum of 15 hours of KU resident credit in the major.

Major Junior/Senior Hours
Satisfied by a minimum of 12 hours from junior/senior courses (300+) in the major.

Major Junior/Senior Graduation GPA
Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (http://clas.ku.edu/undergrad/tools/gpa).

Below is a sample 4-year plan for students pursuing the B.S. in Microbiology. To view the list of courses approved to fulfill KU Core Goals, please visit the KU Core website (http://kucore.ku.edu/courses).

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

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<th>Semester</th>
<th>Hours</th>
<th>Fall</th>
<th>Spring</th>
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<tr>
<td></td>
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<td>Goal 2.1 Written Communication (First Course, 2 Crs Required)</td>
<td>3</td>
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<td>CHEM 130 (Goal 1.2 Quantitative Literacy, General Science Requirement)</td>
<td>5</td>
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<td>BIOL 150 or 151 (Goal 3 Natural Science, General Science Requirement)</td>
<td>4</td>
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<td>MATH 115 (Goal 1.2, General Science Requirement)</td>
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<td>BIOL 105 (General Science Requirement)</td>
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<td>Elective (Total Hours)</td>
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Sophomore

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<th>Semester</th>
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<td></td>
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<td>Goal 4.2 Global Awareness</td>
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<td>MATH 116 (General Science Requirement)</td>
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<td>CHEM 330 (General Science Requirement)</td>
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<td>CHEM 331 (General Science Requirement)</td>
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<td>BIOL 400 or 401 (Major Requirement)</td>
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<td>BIOL 402 (Major Requirement)</td>
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Junior

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<tr>
<th>Semester</th>
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<tr>
<td></td>
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<td>PHSX 114 (or PHSX 211 &amp; 216, Goal 1.1 Critical Thinking, General Science Requirement)</td>
<td>4-5</td>
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<td>BIOL 636 (General Science Requirement)</td>
<td>4</td>
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<td>BIOL 416 (Major Requirement)</td>
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<td>BIOL 518 (Major Requirement)</td>
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<td>BIOL 519 (Major Requirement)</td>
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Senior

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<tr>
<th>Semester</th>
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<tr>
<td></td>
<td></td>
<td>Goal 3 Social Science</td>
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<td>Goal 3 Arts &amp; Humanities</td>
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<td>BIOL 570, MATH 365, or PSYC 210 (General Science Requirement)</td>
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<td>BIOL 503 (Major Requirement)</td>
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<td>BIOL 506 (Major Requirement)</td>
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<td>16</td>
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</table>
BIOL 504 (Major Requirement)  
2 Elective (Total Hours)  
3
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Elective (Total Hours) 1-2
14-15  
13-14
Total Hours 120-124

1 Requires MATH ACT scores 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 + MATH 116 to fulfill the BS Microbiology math requirement.

2 Concurrent or prior enrollment in CHEM 130 is required.

3 BIOL 512, BIOL 513, BIOL 506, BIOL 507, and BIOL 638 and CHEM 135, CHEM 335, and CHEM 336 are offered only in the spring.

4 BIOL 400/BIOL 401, BIOL 402, BIOL 416, BIOL 503, BIOL 504, BIOL 518, BIOL 519, BIOL 570, and BIOL 636 are offered only in the fall.

5 Microbiology major electives: 6 hrs of Biol courses 400+ level to be selected in consultation with a Microbiology advisor.

6 BIOL 599 is approved to fulfill Goal 6. This goal can also be fulfilled by completion of an approved education experience, or an approved integration of courses and/or experiences. See your advisor for more information.

* 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:

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 3.25 overall and 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.