Graduate Degree Programs

The Department of Microbiology at Illinois offers unique opportunities for graduate students to become skilled and creative microbiologists. Our graduate program of study leads to the doctor of philosophy degree (Ph.D.). We have outstanding resources in our internationally recognized faculty, graduate students, and research facilities. This exposes our students to the latest research techniques and fosters their development as independent scientists. The program has particular strengths in the areas of microbial physiology, metabolism, genetics, evolution, and pathogenesis. For an application and departmental materials that provide greater detail on programs, offerings, admission, degree requirements, and financial aid, visit our website at www.mcb.illinois.edu/departments/microbiology (http://www.mcb.illinois.edu/departments/microbiology/).

Graduates from the Department of Microbiology are employed in colleges and universities, industry, and government. Scientific advances in genetic engineering and biotechnology provide many opportunities in pharmaceutical, chemical, and genetic engineering companies.

The Department of Microbiology is a part of the School of Molecular and Cellular Biology (MCB), which also includes the Departments of Biochemistry, Cell and Developmental Biology, Molecular and Integrative Physiology. The Department is part of an umbrella program in MCB that encompasses over 70 different research laboratories. Students admitted into any of these departmental graduate programs can select faculty thesis advisors from these active research laboratories in the School. Close ties are also maintained with the School of Integrative Biology, the School of Chemical Sciences, the College of Medicine, and the College of Veterinary Medicine.

Admission

Students interested in this program must apply directly to the School of Molecular and Cellular Biology (mcb.illinois.edu/graduate/gradprospect (http://mcb.illinois.edu/graduate/gradprospect.html)). During the first semester, students perform three laboratory rotations, choosing from any laboratory in the School. Students select a laboratory for their thesis research in December and formally join the appropriate graduate program/department at that time.

Students electing microbiology as a major for an advanced degree should have had a total of at least 15 credit hours of physical or biological sciences, including general biology or microbiology, chemistry through organic chemistry and biochemistry, and mathematics through calculus. Admission requirements include: a bachelor's degree with course work in biological sciences, chemistry, and physics; Graduate Record Examination (GRE) scores. In addition to the above requirements, international students must attain a minimum Test of English as a Foreign Language (TOEFL) score of 96 on the internet-based test (iBT), with a score of 24 on the speaking section, is also accepted. The department does not admit students into the M.S. program.

Graduate Teaching Experience

Experience in teaching is considered to be a vital part of the graduate program and is required as part of the academic work of all Ph.D. degree candidates. For the Department of Microbiology, a minimum of two semesters of teaching experience is a degree requirement.

Faculty Research Interests

Major areas of research interest include gene expression and regulation in bacteria, archaea, and eukaryotes; virus pathogenesis and host-cell interactions; viruses of bacteria and archaea; membrane biogenesis; lipid and polysaccharide synthesis in bacteria and yeast; cell wall biogenesis; bacterial pathogenesis and bacteria-host interactions; immunology; DNA replication, recombination, and repair; anaerobic microbiology; the biochemistry and physiology of methane formation; mechanisms of oxygen toxicity; bacterial and archaeal genomics, ecology, and evolution. For further details, please consult the Department of Microbiology’s website (www.mcb.illinois.edu/departments/microbiology/).

Facilities and Resources

The Microbiology Department is located in the modern Chemical and Life Sciences Laboratory (CLSL). Central to main campus, the CLSL houses all of the major equipment and expertise necessary for research in microbiology, cell biology, molecular biology, genomics, and biochemistry.

The University of Illinois has excellent core facilities to aid in scientific research, many of which are located in buildings adjacent to CLSL. Each core facility has full-time salaried support staff for training and support. The Roy J. Carver Biotechnology Center (http://biotech.illinois.edu) includes core research facilities supporting genomics, proteomics, metabolomics, flow cytometry, bioinformatics and translational medical research (http://biotech.illinois.edu). The Center for Microscopic Imaging is a campus-wide service center for electron, confocal, and light microscopy.

Several services are available to graduate students for support outside of the classroom and laboratory. The University of Illinois library is the nation’s third largest university library, allowing access to reference books and on-line scientific journals. The Writers Workshop offers free, personal writing assistance for class assignments, scientific manuscripts, and theses. Please visit the School of Molecular and Cellular Biology (http://mcb.illinois.edu) to learn about these and other resources available to graduate students.

Financial Aid

All students admitted into the Ph.D. program receive financial support throughout their graduate training. Incoming graduate students are supported by the School of Molecular and Cellular Biology. Several University Fellowships are awarded to outstanding applicants on a competitive basis. Financial support is usually in the form of a research assistantship, teaching assistantship, and/or fellowship. In addition to this stipend, we offer a tuition and service fee waiver. A health insurance fee and other miscellaneous fees, must be paid by the student.
Master of Science in Microbiology

Students are not admitted to the M.S. program; these requirements are completed as part of the Ph.D. program.

**Thesis Option**

Coursework (not including MICR 590) 8
Research/Project Hours (4 min applied toward degree) 4
MICR 599 Thesis Research (0 min applied toward degree) 0
Total Hours 32

**Other Requirements**

Other requirements may overlap
Minimum Hours Required Within the Unit: 8 (500 level)
Minimum Number of 500-level Hours Required Overall in Program: 12
Completion of one of the following and approval by the research advisor and head of the department: a research thesis; submission of a manuscript with the candidate as first author and to which the candidate has made the major contribution; the successful passing of the departmental preliminary exam.
Minimum GPA: 3.0

Doctor of Philosophy in Microbiology

The requirements for a Ph.D. from the Department of Microbiology include successful completion of course work, teaching, two first-author manuscripts in peer-reviewed journals, passing a preliminary examination and annual assessments of progress thereafter, and writing and depositing a research thesis.

**Master’s level requirements**

Total Hours 32

**Core coursework:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MCB 501 Advanced Biochemistry</td>
<td>3</td>
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<tr>
<td>MCB 502 Advanced Molecular Genetics</td>
<td>3</td>
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<tr>
<td>MCB 580 Res Ethics &amp; Responsibilities</td>
<td>3</td>
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<tr>
<td>MCB 581 Laboratory Rotation I</td>
<td>3</td>
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<tr>
<td>MCB 582 Laboratory Rotation II</td>
<td>3</td>
</tr>
<tr>
<td>MCB 583 Laboratory Rotation III</td>
<td>3</td>
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<tr>
<td>MCB 585 Current Topics in Microbiology</td>
<td>3</td>
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Registration in MICR 595 every semester of enrollment (9 min)
400- or 500-level discussion-based courses (3 min) 3
400- or 500-level lecture-based courses (12 min) 12
Research/Project Hours (min/max applied toward degree): before prelim

MICR 599 Thesis Research (min/max applied toward degree): after prelim
Total Hours 96

**Other Requirements**

Other requirements may overlap
Two first-author manuscripts in peer-reviewed journals. At the time of graduation at least one of these manuscripts must be accepted.

Masters Degree Required for Admission to PhD? No, but Masters level requirements must be met.
Qualifying Exam Required No
Preliminary Exam Required Yes
Final Exam/Dissertation Defense Required Yes
Dissertation Deposit Required Yes
Minimum GPA: 3.0

For specific information, visit our Web site at mcb.illinois.edu/departments/microbiology/gradcurrent.html and refer to the department’s Graduate Student Handbook and the Graduate College Handbook (http://www.grad.illinois.edu/gradhandbook).