# Ph.D. in Microbiology

## Course credits
- A minimum of 60 post-baccalaureate credits are required for graduation. Students who already have an applicable Master’s degree may be able to apply up to 30 credits toward the 60 credits for the Ph.D.

*The 60 credit minimum was instated for students beginning Fall 2007 semester. Students who enrolled prior to this time may stay with the 30 credit minimum previously required.*

- A minimum of 18 Doctoral Thesis (MB 690) credits are required.
- 20 credits of coursework are recommended and at least half of those must be in the major subject area (MB).
- Two-thirds of the minimum 60 credits must be at the 5XX-level. (Undergraduate courses at the 4XX-level are allowed but not 3XX-level).
- Credit in MB 594 Seminar, MB 592 Modeling infectious disease dynamics (individual problem) and MB 598 Internship courses may not exceed 1/3 of credits required.
- Credit for a Professional Paper (MB 575) may not exceed 6 credits.
- Course work more than 10 years old cannot be applied toward the program.
- Transfer credits – see The Graduate School policy at Transferring Credits (http://www.montana.edu/gradschool/policy).

## Pass-fail
No more than 3 credits taken on Pass/Fail basis may be applied to a Ph.D. program (aside from thesis credits). For more information on Pass/Fail courses, see The Graduate School policy on Pass/Fail (http://www.montana.edu/gradschool/policy/degreq_specialcourses.html#degreq_special_pass_fail).

## Core Curriculum
All Ph.D. students are required to take two courses: MB520 - Microbial Physiology (fall semester) and BIOB524 - Ethical Practice of Science (spring semester).

In addition, all Ph.D. students are required to take at least one course in four of the six areas of the core curriculum. The six areas of the core curriculum and the courses which can be used to satisfy the requirement are:

<table>
<thead>
<tr>
<th>Bioinformatics</th>
<th>MB 537</th>
<th>Advance in Molecular Evol (Fall TBA)</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB 544</td>
<td></td>
<td>Advanced Bioinformatics (Spring even yrs)</td>
<td>4</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>BCH 543</td>
<td>Proteins (Fall odd yrs)</td>
<td>3</td>
</tr>
<tr>
<td>BCh 544</td>
<td></td>
<td>Molecular Biology (Spring odd yrs)</td>
<td>3</td>
</tr>
<tr>
<td>MB 527</td>
<td></td>
<td>Toxicology (Spring)</td>
<td>3</td>
</tr>
<tr>
<td>Immunology</td>
<td>MB 525</td>
<td>Advanced Immunology (Spring even yrs)</td>
<td>3</td>
</tr>
<tr>
<td>Microbial evolution &amp; ecology</td>
<td>MB 560</td>
<td>Infectious Disease Ecology &amp; Spillover (Fall)</td>
<td>3</td>
</tr>
<tr>
<td>MB 591</td>
<td></td>
<td>Special Topics (Precambrian Biosphere)</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 505</td>
<td></td>
<td>Geomicrobiology (Spring even yrs)</td>
<td>3</td>
</tr>
<tr>
<td>Microbial genetics &amp; physiology</td>
<td>MB 528</td>
<td>Advanced Genetics (Spring odd yrs)</td>
<td>3</td>
</tr>
</tbody>
</table>

| IMID 505 | Eukaryotic Gene Regulation (Spring odd yrs) | 3 |
| EBBIO 566| Fundamentals of Biofilm Engr (Fall)        | 3 |

## Microbial pathogenesis & epidemiology
- MB 505 Host-Associated Microbiomes (Fall) 4
- MB 530 Virology (Fall) 3

## Scientific Writing
- MB 591 - Scientific Proposal Writing 3

Courses required to fill each area of the core are likely to change as new courses are developed and approved by the Graduate Program Committee. Current course descriptions are available in the MSU On-Line Catalog. Current course availability is found in the MSU On-Line Schedule of Classes.

- **MB 500 seminars**
  - All students are required to attend and participate in the Departmental Seminar (MB 594 section 01) each semester in residence. [Students who are also members of the Center for Biofilm Engineering will have the option of attending either the Departmental Seminar or the CBE Seminar during their first two years, but must attend at least two semesters of each during this time.]
  - Students are encouraged to register for these each semester, if possible, although there are limits to the number of MB 594 credits allowed in a Graduate Program (3 for M.S.)
  - Have the office staff register you online – there are conflicts when taking multiple MB 594 sections.

- **Laboratory Rotations.** New students in the Ph.D. program are encouraged to participate in laboratory rotations. Students will be expected to work at least 12 hours per week in each rotation and will register for two semester credits of MB 592 Modeling infectious disease dynamics (Individual Problems) each semester.

- **Minor/Supporting Area.** A student has the option of including a minor (15 credits) or a supporting area (9 credits) in their degree program.

- **Dissertation**. A dissertation approved by the Graduate Committee, Department Head, and the Dean of The Graduate School is required. This must be submitted as an electronic dissertation not later than 14 days before the end of the semester.

- A hardbound copy of the dissertation must be provided to the Microbiology Department for inclusion in the Cotner-Morris library.

*No more than five years may pass between successful completion of comprehensive exams and the time of completion of the Ph.D. degree. For more details on doctoral requirements, refer to The Graduate School policies (http://www.montana.edu/gradschool/policy).*
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.