

**DEPARTMENT OF
MICROBIOLOGY & IMMUNOLOGY**

MASTERS STUDENT HANDBOOK

2023 – 2024

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UNIVERSITY OF MICHIGAN



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WHO DO I ASK ABOUT...?

| | |
|---|--|
| M.S. degree requirements, course selection | Phil Hanna, Natalie Deeb |
| Course registration, graduate student forms | Natalie Deb |
| Keys, building access | Natalie Deb |
| Departmental computers, projectors, microphone, | office staff |
| Graduate Studies matters | Phil Hanna |
| Reimbursements (travel, entertainment) | Kim Rize |
| Scheduling meeting rooms | Natalie Deeb |
| Issues with personal computer for research activities | https://michmed.service-now.com/sp (HITS) |

GENERAL INFORMATION

The M/I Department has instituted a M.S. degree program through the Rackham School of Graduate Studies. M.S. students are admitted directly to the M/I Department.

This handbook outlines the steps necessary to complete the requirements for the M.S. in the Microbiology and Immunology Department.

MICROBIOLOGY & IMMUNOLOGY GRAD STUDIES COMMITTEE

The role of the M/I Graduate Studies Committee is to advise students, address student concerns, facilitate M/I admissions, approve dissertation committee selections, approve advancement to candidacy, and resolve issues concerning the graduate student curriculum. The Committee is appointed by the Department Chair and includes a Chair, Associate Chair(s), faculty members (both primary and joint appointees).

REQUIREMENTS FOR M/I MASTER STUDENTS

(For Rackham requirements, see <http://www.rackham.umich.edu/policies/academic-policies/section6>)

1. A minimum of 28 credit hours in didactic graduate-level course work (*course numbers designated 400 and above except as noted), excluding MICRBIOL 812 seminars and research. Students are required to earn a grade B or better in required course work; this may necessitate re-taking a required course prior to obtaining the master's degree. Students must maintain an overall average of B or better for all coursework.
2. The course requirements detailed in "COURSE SELECTION," below.

ACADEMIC ADVISING

Each pre-candidate MS student in M/I meets individually with the M/I Master Program Chair twice a year, before Fall and Winter terms, to discuss course work, lab research and thesis preparations (if applicable,) and performance.

COURSE SELECTION

Objectives for the M/I curriculum

- 1) Provide a solid foundation in the core concepts of microbiology and immunology.
- 2) Maximize curriculum possibilities for each student by customizing coursework that builds on pre-graduate education and graduate education desire.

1. Required M/I coursework: M/I MS students must take **eight** credits for full time status. Students must earn a grade B or better in the required course work; this may necessitate re-taking a required course prior to obtaining the MS degree.

Microbial Pathogenesis: at least **three** credits from among:
MICRBIOL 405 (3 CR) Introduction to Infectious Disease

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MICRBIOL 415 (3 CR) Virology
MICRBIOL 607 (2 CR) Microbial Pathogenesis
MICRBIOL 615 (2 CR) Viral Pathogenesis

Immunology: **three** credits from among:

MICRBIOL 540 (3 CR) Human Immunology
MICRBIOL 640 (3 CR) Molecular and Cellular Immunology (*with permission*)
MICRBIOL 812 (1 CR) Student Seminars in M&I: at least **one** credit

Statistics: at least **one** credit from:

MICRBIOL 612 (2 CR) Microbial Informatics
BIOSTAT 501 (4 CR) Math Foundations Bioinformatics
BIOSTAT 523 (3 CR) Bioinformatics Basic Bio Lab
BIOINF 527 (4 CR) Introductory Bioinformatics and Computational Biology
BIOINF 528 (3 CR) Structural Bioinformatics

2. Additional required courses: at least **nine** additional 400-level or above credits in M&I courses, including but not limited to additional courses from the above, plus:

MICRBIOL 430 (3 CR) Symbiosis (*offered every other year*)
MICRBIOL 460 (3 CR) Eukaryotic Microbiology
MICRBIOL 409 (4 CR) Investigational and Experimental Bacteriology

3. Elective credits: M&I MS students need at least **eleven** elective credits approved by the Department. Electives should be selected to complement the student's interests and needs. Electives for M/I master students include the following; see appendix for a list of current classes listed by the term they are currently offered. If the student wants to count other courses not listed here toward the 11 credits of electives, s/he must get prior approval from the Program Chair. Course offerings change frequently, so students should check the PIBS Curriculum Guide for the most recent listings:

<http://www.med.umich.edu/pibs/pdf/curriculum.pdf>

Approved Electives:

BA 518 (2.25 CR) The Business of Biology (Fall)
BIOINF 527 (4 CR) Introductory Bioinformatics and Computational Biology (Fall)
BIOINF 528 (3 Cr) Structural Bioinformatics (Fall)
BIOSTAT 501 (3 CR) Intro to Biostat (Fall)
BIOSTAT 523 (3 CR) Bioinformatics Basic Bio Lab (Fall)
CANC BIO 554 (3 CR) Science of Cancer (Winter)
CDB 530 (3 CR) Cell Biology (Fall)
ENGR 490 (1 CR) Special Topics (Fall)
EPID 505 (3 CR) Polymicrobial Communities in Human Health and Disease (Fall)
EPID 600 (4 CR) Introduction to Epidemiology (Fall)
ES 515 (3 CR) Intro to Entrepreneurship (Winter)
IMM 850 (3 CR) Experimental Immunology (Winter)
IMM 541 (2 CR) Special topics in Immunology (Winter)
MICRBIOL 612 (2 CR) Microbial Informatics (Workshop- Winter)
PATH 581 (3 CR) Tissue, Cellular and Molecular Basis of Disease (Winter)
PHYSIOL 519 (4 CR) Quantitative Physiology (Fall)
PHYSIOL 576 (1 CR) Signal Transduction (Winter)
PHYSIOL 577 (2 CR) Membrane and Cell Physiology (Winter)
PIBS 503 (1 CR) Research Responsibilities and Ethics (Fall)
PUBPOL 650 (3 CR) Intro to Science and Technology Policy Analysis (Winter)
PUBPOL 754 (4 CR) Research Seminar in Science, Tech and Public Policy (Winter)

[Type here]

Electives to a total of **28 credits**: These can be drawn from any of the approved courses above, additional research credits, or other courses at the 400 level or above that are approved by the master's Program Advisor. If you are interested in taking a course that is not listed; please send Natalie Deeb and Phil Hanna the course description and the reason it would be relevant to your degree.

Summary of Course Requirements

The minimal requirements for the Master of Science in Microbiology and Immunology program are 28 credits:

- 16 credits in Microbiology and Immunology at the 400 level or above
- 1 credit in statistics
- 11 additional credits in approved coursework

All time, residency, and transfer of credit requirements will be in accordance with existing Rackham rules. Coursework must be completed with a B or better. There are no teaching or foreign language requirements.

Microbiology & Immunology M.S. Program

Additional information can be found at

<https://medicine.umich.edu/dept/microbiology-immunology/education/masters-program>

DEGREE OPTIONS

1. Non-Research Option

Recognizing that some students who enroll in the Microbiology and Immunology Master's Degree program may not be preparing for careers in research, or may decide to pursue other directions after an initial term of research, students can complete the degree with 28 credits whether or not research is included, provided other degree requirements are satisfied. Students intending to pursue the non-research master's degree in Microbiology and Immunology should design a plan of study in consultation with the master's advisor, and this plan will be kept in the student's departmental file. Completing their approved personalized plan of study will be a requirement for each student who wishes to receive the master's degree.

2. Research Option

Performing laboratory research is not a requirement of the Master of Science in Microbiology and Immunology. However, in keeping with departmental strength in research and the value of research experience for students, all master's students interested in research are encouraged to pursue it. The program will facilitate research opportunities for all enrolled in the master's degree program. Research Track Master's students will not perform research rotations but will enter mutually agreed-upon relationships with Microbiology and Immunology faculty research mentors prior to enrolling in research credit for the terms in which research will be performed. The student and research mentor will plan for requisite safety coursework and will discuss expectations (5-6 hours/week per semester which is 3 credits of research per term) prior to the start of research. In addition to providing a letter grade, the faculty member will provide a written evaluation for the student's departmental file, to be discussed and signed by the student, at the end of each term.

3. Thesis Option

Matriculated students who have maintained an overall B+ average and intend to pursue at least two terms of laboratory research can opt to write a research-based thesis as part of their master's degree. They will defend their thesis to their thesis advisor and two additional committee members. Upon successful defense of the thesis, the Microbiology & Immunology program will then ensure that the student's degree is awarded with a designation indicating that they defended a thesis.

Detailed Course Requirements

Matriculated students who have maintained an overall B average and intend to pursue at least two terms of laboratory research can opt to write a research-based thesis as part of their master's degree by the following procedure. The requirements for the thesis option include those for the non-thesis option and include additional coursework and research requirements.

Additional required coursework:

- PIBS 503 (1 CR) Research responsibilities and ethics
- MICRBIOL 599 (1-8 CR) Graduate Research: Two semesters of laboratory research with at least two credits per semester

Thesis:

At least two months before the start of the student's final term in the master's degree program, the student must:

- Identify a member of the M&I training faculty willing to serve as their thesis advisor and two additional faculty willing to serve as readers. Devise a plan for a suitable research project, generally to be based on the Student's ongoing research performed in the thesis mentor's laboratory. Gain ratification of a one-page outline of the plan from the thesis advisor and readers and submit the plan to the M&I Graduate Studies Committee for approval.
- At least three weeks before the student's final term ends, the student must provide the thesis advisor and readers with the final version of a research-based master's thesis, written in the general style and depth of a scientific paper. Within ten days, these individuals will evaluate the thesis and provide a written evaluation of the thesis with a recommendation of pass or no pass to the thesis advisor. The student must submit their final result of the thesis evaluation to the M&I Department (Natalie Deeb) at least one week before the end of the student's final term. The form can be obtained from the office (Natalie Deeb) or online. Although oral presentation is not required, it is highly recommended to present the research at Student Seminar (MICRBIOL 812).
- Provided all course credits and other degree requirements have been satisfied, the student Master's thesis will either be awarded if the recommendation was pass, or the student will be awarded a non-thesis Master's degree, using either the Research Track or the Non-Research Track described below, as decided by the Program Advisor in consultation with the faculty who evaluated the thesis.
- The M&I program will then ensure that the student's degree is awarded with the correct notation regarding whether or not a thesis was completed. In practice, the student should notify the master's Program Advisor and thesis advisor of any changes in intention to complete a master's thesis whenever such changes arise. Any deviations from this policy for evaluating a master's thesis can be made only upon the recommendations of the student's thesis advisor and the M&I Master's Program Advisor and will require approval from the full M&I Graduate Studies Committee.

M/I STUDENT SEMINAR (MICRBIOL 812)

Student seminars are presented Fridays from 12-1 p.m. Second, third, and fourth year PhD students present seminars on their own research. Students work with the research mentor to prepare the talk and practice it formally before the actual presentation. **Students must send out an email to the department (microbiology@umich.edu) one week in advance with their name, mentor's name, title of abstract, and abstract.** At the formal seminar, discussion and criticism of the research by the audience are encouraged. Two faculty members evaluate and discuss the presentation with each student at the end of the seminar. Attendance is required for all students.

DEPARTMENTAL SEMINARS

Microbiology & Immunology seminars start at 12:00 noon on Thursdays. All faculty and graduate students should consider attendance at the departmental seminar to be mandatory. The seminar series features cutting-edge work

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in microbiology and immunology. For your own professional development and as a courtesy to the speakers and hosts please make it a habit to attend the seminars. The schedule is listed on the M/I website <https://medicine.umich.edu/dept/microbiology-immunology/seminars>
Michigan Medicine offers a Calendar of events and other seminars that may be of interest: <https://umhsheadlines.org/events/>

HEALTH AND WELLNESS

(From the Rackham website): Rackham offers a variety of health and wellness activities for students, and provides information to faculty, staff, and students to help you navigate the resources available to support you in graduate school. An extensive list of topics, including alcohol, tobacco and other drugs; domestic violence/child abuse; eating disorders; mental health; sexual harassment; sleep; etc. can be found at this site http://www.rackham.umich.edu/student_life/health_and_wellness/resources/

GRIEVANCE PROCEDURES

If appropriate, a student's first course of action may be to discuss a grievance with his/her research mentor or the MS program director, who will consult with the Department Chair and the Grad Studies Committee, as appropriate.

Rackham also has resources about grievances:

http://rackham.helpserve.com/index.php?_m=knowledgebase&_a=viewarticle&kbarticleid=151

From the Rackham website: Depending on the issue or concern, your grievance or complaint could be handled by a variety of University resources. For instance, Rackham's Academic Dispute Resolution Policy and Procedures: http://www.rackham.umich.edu/policies/dispute_resolution/academic_dispute_resolution/ addresses academically related complaints or grievances. Any Rackham graduate student can use these procedures to file a grievance.

Rackham's Academic and Professional Integrity Procedures:

http://www.rackham.umich.edu/policies/academic_and_professional_integrity/ address allegations of academic or professional misconduct against graduate students. Any student, faculty or staff can file a complaint against a graduate student under Rackham's Integrity procedures.

M/I graduate students are responsible for knowing the policy and procedures on academic honesty at the University of Michigan. See the Rackham Statement on Graduate Academic and Professional Integrity, http://www.rackham.umich.edu/policies/academic_and_professional_integrity/statement_on_academic_integrity/

MAIZE/NET APP STORAGE (DEPARTMENT STORAGE)

The M/I department has a share on the Maize/Net App server called MicroBio. As a Grad student should you need additional backup or storage you will need to see Natalie and have your mentor request access via MSIS.

MICROBIOLOGY & IMMUNOLOGY MASTERS PROGRAM CONTACTS

Student Services Coordinator:

Natalie Deeb

deebn@med.umich.edu

Master's Program Director: Phil

Hanna pchanna@umich.edu

APPENDICES

Microbiology & Immunology Master Program Courses by Semester

Microbiology & Immunology Master's Thesis Submission/Confirmation Form

Suggested timeline for thesis submission and approval to graduate in the winter term

Microbiology & Immunology Master Program Courses by Semester

| | Fall | Winter |
|--------------------|--------------------------|-------------------------|
| M&I Core courses | MICRBIOL 405 (3) | MICRBIOL 405 (3) |
| | MICRBIOL 640 (3) | MICRBIOL 415 (3) |
| | | MICRBIOL 540 (3) |
| | | MICRBIOL 607 (3) |
| | | MICRBIOL 615 (2) |
| Other M&I courses | MICRBIOL 409 (4) | MICRBIOL 430 (3) * |
| | MICROBIOL 599** | MICRBIOL 460 (3) |
| | MICRBIOL 812 (1) | MICROBIOL 599** |
| | | MICRBIOL 812 (1) |
| Statistics | BIOSTAT 501 (4) | BIOINF 524 (525) (3, 1) |
| | BIOSTAT 521 (3) | MICROBIO 612 (2) |
| | BIOINF 523 (4) | |
| | | |
| Approved Electives | BA 518 (2.25) | CANCBIO 554 (4) |
| | BIOINF 551 (3) | ES 515 (3) |
| | CDB 530 (3) | IMMUNO 850 (3) |
| | ENGR 490 (1) - (7 weeks) | PATH 581 (3) |
| | PIBS 503 (1) ** | PUBPOL 650 (3) |
| | EPID 600 (4) | PUBPOL 754 (4) |
| | PHYSIOL 519 (4) | |
| | PHYSIOL 576 (1) | |
| | PHYSIOL 577 (2) | |
| | | |

*Offered every other year

**Research and Thesis option MICROBIOL 599 and PIBS 503 are require

Master's Program in Microbiology and Immunology Thesis Submission/Evaluation

Please submit this report, properly completed and signed by each committee member or substitute in attendance, to the Department of Microbiology and Immunology (Heidi Thompson: heiditho@umich.edu) at least one week before the student's final term.

The Committee of (student's name) _____ candidate for the degree of Master of Science in the field of **MICROBIOLOGY AND IMMUNOLOGY**

Submits this report of the thesis evaluation.

Results of the thesis evaluation

(Please represent both the consensus of the committee and the range of views.)

_____passed

_____not passed

Comments:

Student signature/date: _____

Thesis Advisor signature: _____

Committee Member signature: _____

Committee Member signature: _____

Suggested timeline for thesis submission & approval to graduate in the winter term

- Form a thesis committee: by Feb 15
- Submit the final version of the thesis to the committee members: by March 30
- Evaluate the thesis by the committee: by April 10
- Submit the final result of the thesis evaluation to Phil Hanna pchanna@umich.edu and Heidi Thompson heiditho@umich.edu by April 14