

# MASTER OF SCIENCE (M.S.)

## Note: The Microbiology and Immunology Track Graduate Program is sunsetting and therefore no longer admitting new students. See the Graduate School of Biomedical Sciences, *Molecular Immunology & Microbiology* Discipline of the IBMS Graduate Program.

The graduate program in Microbiology focuses on microbial infection, host responses to infection, and other aspects of the immune system in health and disease. The track faculty members apply state-of-the-art experimental approaches, including genomics, proteomics and bioinformatics, as well as other genetic, biochemical, cellular and functional assays to study the regulation, host interactions and pathogenesis of viral, bacterial, fungal, and parasitic infections. In addition to mechanisms of host interactions with microorganisms, responses to allergens, tumor, and self-antigens are also investigated at the molecular, cellular and systemic levels. Students will have the opportunity to gain the broad knowledge and skills necessary for future research careers in many different areas of basic and clinical life sciences, including Microbial Genetics, Physiology and Pathogenesis, Infectious Diseases, Immune Regulation, Vaccinology, Tumor Immunology, Autoimmunity and Allergy.

## Microbiology and Immunology Admissions Requirements

Applicants are required to have a minimum of a Bachelor's degree from an accredited institution and a minimum GPA of 3.0/4.0. Applicants should have received credit for courses taken in:

- Biology<sup>1</sup> 2 yrs. as required for science majors
- Chemistry<sup>1</sup> 1 yr. general chemistry and organic chemistry
- Physics 1 yr.
- Mathematics minimum of 1 semester of calculus

<sup>1</sup> courses should include laboratory experience

All applicants must take the Graduate Record Examination (GRE). The GRE must be taken within the last 5 years and the TOEFL within the last 2 years. There is no minimum score required for the GRE.

In addition to the GRE, international applicants are also required to take one of two English proficiency tests: Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS: Academic module only). The minimum required scores for the TOEFL are 560 for the paper test and 68 for the internet test. The minimum score on the academic IELTS is 6.5.

At least three letters of recommendation and a personal interview are required. The applicant must submit 3 essays stating the reasons for your interest in the program, a description of your professional goals and an outline of your undergraduate, industrial or summer research.

The admission committee makes its decision based on the candidate's research experience, grade point average, personal statement, GRE score,

interviews, letters of recommendations, and how the candidate matches up against other interested applicants.

## Microbiology and Immunology Degree Requirements

A minimum of 30 credit hours and a minimum overall GPA of 3.0 is required for the M.S. degree. In addition, all master's candidates must register for MICR 6098 Thesis for at least one semester in order to graduate. The student must successfully defend a thesis and be recommended by their program COGS for approval of their degree to the Dean of the Graduate School of Biomedical Sciences.

The following M.S. Plan of Study is basically the same as for the Ph.D. program. The main differences are the length of the program, and the Thesis requirement rather than Dissertation. Another difference, not shown, is that there is no Qualifying Examination requirement for the M.S. degree.

## Microbiology and Immunology Plan of Study M&I Track - Plan of Study (Course Curriculum Timeline)

First Year		Credit Hours
Fall		
IBMS 5000	Fundamentals Of Biomedical Sciences	8
IBMS 5008	Lab Rotations	2
	Journal Club (any track)	
	Attend weekly research seminars (any track once/week)	
Total Credit Hours:		10.0

First Year		Credit Hours
Spring		
MICR 5003	Core Concepts In Microbiology & Immunology	4
MICR 5029	Building Scientific Thinking Skills	2
INTD 6002	Ethics In Research	0.5
IBMS 5008	Lab Rotations	1-3
MICR 5091	Current Topics In Microbiology And Immunology	0.5-3
	Journal Club (any track)	
Total Credit Hours:		8.0-12.5

Second Year		Credit Hours
Fall		
MICR 5090	Acquiring Presentation Skills	1
MICR 5030	Microbiology And Immunology Track Journal Clubs	0.5
MICR 6091	Seminars In Microbiology & Immunology	1
MICR 6097	Research	1-12
	Advanced Elective if available - see department	
Total Credit Hours:		3.5-14.5

**Second Year**

<b>Spring</b>		<b>Credit Hours</b>
MICR 5090	Acquiring Presentation Skills	1
MICR 5030	Microbiology And Immunology Track Journal Clubs	0.5
MICR 6091	Seminars In Microbiology & Immunology	1
MICR 6097	Research	1-12
Advanced Elective if available - see department		
Total Credit Hours:		3.5-14.5

**Third Year**

<b>Fall</b>		<b>Credit Hours</b>
MICR 5090	Acquiring Presentation Skills	1
MICR 5030	Microbiology And Immunology Track Journal Clubs	0.5
MICR 6091	Seminars In Microbiology & Immunology	1
MICR 6097	Research	1-12
MICR 6098	Thesis	1-12
Total Credit Hours:		4.5-26.5

**Third Year**

<b>Spring</b>		<b>Credit Hours</b>
MICR 5090	Acquiring Presentation Skills	1
MICR 5030	Microbiology And Immunology Track Journal Clubs	0.5
MICR 6091	Seminars In Microbiology & Immunology	1
MICR 6097	Research	1-12
MICR 6098	Thesis	1-12
Total Credit Hours:		4.5-26.5

## **Microbiology and Immunology Objectives/ Program Outcomes**

1. Students will be able to demonstrate proficiency in core (general) principles of the biomedical sciences and in principles specific to the discipline of microbiology/immunology.
2. The student will be able to conduct biomedical research.
3. Students will be able to demonstrate competence in written and verbal communication.
4. Students will be able to critically read and evaluate the biomedical literature.
5. Students will have a fundamental knowledge of ethics in research.
6. Students will complete thesis research, and write and successfully defend their thesis.