

## MICROBIOLOGY AND MOLECULAR GENETICS AMP

All students must meet the Requirements for the Accelerated Master's Degree Pathways

### OVERVIEW

The Accelerated Master's Degree Entry Pathway (AMP) in Microbiology and Molecular Genetics is designed to offer select UVM undergraduate science majors the opportunity to obtain both their Bachelor's degree and Master's degree in Microbiology and Molecular Genetics in a total of 5 years of study. The objective of this program is to provide a broad knowledge base of microbiological and molecular genetic concepts to improve students' relative standing towards pursuing additional graduate degrees (Ph.D., M.D.) or to prepare students for careers in pharmaceutical, biotechnology and related industries.

Students enrolled in this pathway can have up to 9 credits of graduate-level (5000- or 6000-level) courses, which are taken during their Senior undergraduate year, count towards both a Bachelor's Degree and the Master's Degree in Microbiology and Molecular Genetics. Students must apply and be admitted to the M.S. in Microbiology and Molecular Genetics prior to taking any graduate courses that will count towards both degrees. In their Senior year, their primary curriculum is their undergraduate major with a secondary curriculum for the M.S. Following completion of their Bachelor's, the graduate program becomes the primary curriculum and students are expected to complete the remaining Master's Degree requirements during a 5<sup>th</sup> year of full-time study. Students interested in the Microbiology and Molecular Genetics AMP should contact the Program Coordinator.

### SPECIFIC REQUIREMENTS

#### Requirements for Admission to Graduate Studies for the Degree of Master of Science in Microbiology and Molecular Genetics

Students should apply for admission into the Accelerated Master's Degree Program in Microbiology and Molecular Genetics with a minimum of 75 credits and before the start of their 1<sup>st</sup> semester of their Senior year. Admission into this program requires the following:

- A minimum cumulative grade point average of 3.00.
- Enrollment in an undergraduate Bachelor's degree program and completion of at least 1 year of Introductory Chemistry, 1 year of Organic Chemistry, Calculus I, MMG 2010, MMG 2040, BCOR 2300, and BCOR 2500 or MMG 2990C.
- GRE/GMAT scores are NOT an admission requirement for the Accelerated Master's Degree Program in Microbiology and Molecular Genetics program.
- Students must identify a research mentor within the Department of Microbiology and Molecular Genetics in whose laboratory they will conduct their Master's degree research.
- Students **MUST** be admitted through the Graduate College before taking any courses that will be applied to the Master's Degree.
- Courses taken as an undergraduate that will then count towards the Master's Degree must be graded with letter grades (A-F, not P/F, S/U, SP/UP). Independent study, internship and research credits are not allowed to count towards the Master's degree.
- If more than 9 credits of graduate level coursework are taken prior to receipt of the Bachelor's, **ONLY 9 credits** will count towards the Master's. There are no exceptions.
- Students are expected to initiate Master's Degree research in the summer following their undergraduate graduation. Students who graduate in January may initiate Master's research in the spring semester and are expected to continue the research in the summer.

#### Application Process

- Completion of application to the Graduate College, meeting all Graduate College application requirements.
- Include at least 3 letters of recommendation, 1 must be from your identified research mentor.
- Include the "Accelerated Masters Permission" form, which can be found on the Graduate College website. This document must be signed by the indicated parties before being uploaded to your application.

#### Minimum Degree Requirements

A minimum of 30 credits are required for completion of the Accelerated Master's Degree in Microbiology Molecular Genetics. Of the 30 credits, at least 15 must be graded coursework (with at least 6 of those at the 6000-level or above) and 8 must be Master's thesis research credits. Students must also meet the Graduate College requirements for the Master's Degree including maintaining a minimum GPA of 3.00.

Courses should be selected from the following lists.

Complete the following courses:		
BIOC 6001	General Biochemistry I *Successful completion of BIOC 3005 can substitute for the BIOC 6001 requirement for previous UVM students only. However, this will NOT count towards the 30-graduate credit requirement for the degree and thus cannot be used as part of the 9 credits that double count towards the bachelor's and master's degree.	3
MMG 6890	Graduate Teaching Practicum	3
MMG 6990	Special Topics (Ethics in Graduate Research)	1

Students must complete at least 1 approved course in Bioinformatics Databases		
MMG 5310	Bioinformatics & Data Analysis	3
MMG 5320	Advanced Bioinformatics (MMG 5310 or equivalent experience required as a prerequisite)	3
Students must complete at least 1 upper-level course in Molecular Genetics		
MMG 5110	Gr Bacterial Genetics	3
MMG 5270	Advanced Cancer Genetics	3
Students must complete at least 1 upper-level course in Microbiology		
MMG 5210	Gr Medical Microbiology	3
MMG 5220	Gr Medical Micro w/lab	0 or 4
MMG 5230	Immunology Concepts	3
MMG 6200	Cellular Microbiology	4
Remaining credits in the degree program should be selected from graduate courses approved by the student's Studies Committee		
At least 8 (and up to 14) credits of Master's Thesis Research (MMG 6391) are required. In addition, a written thesis and defense of this thesis must occur according to the guidelines laid out by the Graduate College.		

fourth member at the discretion of the student in consultation with their research mentor.

#### Thesis Writing and Defense:

Thesis writing cannot begin until a student has become a Candidate for the Degree of Master of Science in Microbiology and Molecular Genetics and has received approval from the student's Studies Committee.

### Comprehensive Examination

By the end of the first semester following receipt of the Bachelor's Degree, M.S. students will write either an extensive literature review or research proposal that pertains to their research interests. Students can expect guidance from their advisor and Studies Committee in the writing of the proposal, but must assume responsibility for the final version and must acquire sufficient mastery of their chosen subject area to defend the proposal. Students will present their written proposal to their Studies Committee. That Committee will determine if the written proposal is satisfactory and, if it is, schedule an oral defense. During the oral defense, the Committee shall be free to explore the knowledge of the student on a range of subjects related to the proposal, much as occurs during a thesis defense. If the written review/proposal is deemed unsatisfactory or if a student fails the oral defense, the candidate will be given 1 opportunity to rewrite or re-defend his/her proposal. If the student fails a second time, s/he/they will be dismissed from the M.S. program.

### Requirements for Advancement to Candidacy for the Degree of Master of Science

Advancement to candidacy requires satisfactory completion of the comprehensive exam.

#### Studies Committee:

The student's Studies Committee will consist of the student's research mentor, a member of the MMG graduate faculty, a faculty member from outside the Microbiology and Molecular Genetics Department to serve as the Chair of the Studies Committee and a