

The MIP Masters of Science (professional) Program

Policies and Procedures for Graduate Students

This document is designed to address policies specific to students who are enrolled in the MIP Masters of Science (professional) Program. It should not be considered all-inclusive, but rather should be read in conjunction with the current Graduate and Professional Bulletin of Colorado State University

I. Description of Program

With the growth of biotechnology and the increase in technology and specialization in applied microbiological sciences, there is a significant regional and national need for additional educational opportunities for individuals wishing to pursue a career in these industries. In addition, many students wish to pursue additional post-baccalaureate studies, including PhD, DVM, MD, DO, and other advanced degree programs. The MIP department previously did not offer a mechanism to meet these needs. Hence we have developed the MIP Masters of Science (professional) Program which is designed to be completed within a year.

The overall goal of the Program is to build upon a student's undergraduate training in the life science to provide them with advanced knowledge – particularly in applied and health areas of the discipline – so that they achieve the skill set necessary to be competitive for future employment in the field or for admission to professional schools. This will be accomplished through:

1. A rigorous curriculum designed to provide cutting-edge knowledge in both theoretical and applied aspects of microbiology, virology, immunology, infectious diseases, and molecular biology.
2. A strong emphasis in coursework on aspects of the discipline that will be useful in real world employment scenarios.
3. A well-rounded curriculum that includes the development of vital professional skills such as verbal and written communication, understanding policies/regulations in the discipline, and biosafety.
4. Active communication with regional and national representatives from the pharmaceutical, biotech, government, veterinary, and public health sectors to ensure that the program's curriculum remains pertinent and effective.
5. Effective avenues have been developed to ensure a high level of communication in the program to facilitate active mentoring, networking and career discussions.
6. Taking full advantage of the cutting-edge facilities and expertise available in the Department of Microbiology, Immunology, and Pathology.

An Overview of the MIP Masters of Science (professional) Program:

A. Administration:

This body will provide overall leadership, recruiting, planning and assessment for all aspects of the MIP Masters of Science (professional) Program in order to attain its objectives.

- Program Director: Dr. Brian Geiss
- Steering Committee: A subcommittee of the MIP Graduation Education Committee
- Admissions committee: The Steering Committee plus the Program Director

Administrative Philosophy/Guidance

A dedicated MIP Masters of Science (professional) Program Director will coordinate programmatic activities and provide academic and career guidance to students. Communication in the program will be maintained through weekly ‘MIP MS-B Topics’ meetings run by the director that will provide both training as well as a forum to discuss a variety of programmatic issues with all trainees. The Program Director will also be responsible for contacting companies and extramural employers to establish connections for the program. These connections will provide both input as to skill sets required of our graduates as well as potential networking opportunities for students. Targeted companies will include Colorado based organizations such as Solix Biofuels, Inviragen, New Belgium and other FoCo breweries, Leprino Foods as well as national/international biotech and pharmaceutical corporations. The Program Director may also help students identify research or other professional experience opportunities depending on the availability of such opportunities.

B. Recruitment Information

Our goal is to actively recruit a critical mass of highly qualified, motivated students

- **Class Size:** The current goal is to recruit ~40 students per year
- **Admission Policy:** Candidates are specifically offered acceptance to the MIP Masters of Science (professional) degree program. This is an independent graduate program not formally connected with other graduate programs within the department or college. Admission to the Program does not allow students to freely switch to other departmental, college, or university graduate programs – they must apply to other programs through normal routes.
- **Financial Aspects:** Students are solely responsible for their full tuition and fees for the MIP Masters of Science (professional) Program. The MIP Department will not provide tuition assistance or stipend support.

II. Admission/Application Procedures

Application is made through the on-line application to the MIP Masters of Science (professional) Program as outlined on the CVMBS Masters Programs website. All applications are reviewed by the MIP Masters of Science (professional) Program Admissions Committee who will make the final decision regarding admission. It is

anticipated that up to 50 students per year will be offered admission to the Program in order to maintain a critical mass for student success.

III. Advisor and Graduate Committee

The Program Director and Program Steering Committee will respectively serve as advisor and graduate committee for students in the MIP Masters of Science (professional) Program.

IV. Laboratory Rotation Policy

Laboratory rotation research is not a specific component of the MIP Masters of Science (professional) Program. However, if students are interested in research or other opportunities to enhance their experience in the MIP Masters of Science program, the Program Director may help students identify extra opportunities if the student is showing adequate and consistent performance in the program.

V. Student Responsibilities & Scholastic Standing

The responsibilities of a student in the MIP Masters of Science (professional) Program include, but are not limited to, those outlined in the Graduate and Professional Bulletin under the section on “Student Rights and Responsibilities” as well as in the MIP Departmental Code. The progress of each student will be evaluated bi-annually by the Program Steering Committee. Substandard performance in course work is grounds for probation or dismissal from the Program in accordance with Graduate School Guidelines.

Each student must maintain a cumulative grade-point average of 3.0 in all graduate course work taken at CSU. According to Graduate School procedures, the student will be subject to dismissal in second semester in which a 3.0 cumulative GPA is not maintained. Petitions for exceptions may be filed by the student to the Program Steering Committee.

VI. Evaluation of Graduate Student Progress

It is important that the MIP Masters of Science (professional) Program ensures that students are making adequate progress and to deal with any issues that arise in the area of student performance expeditiously. Therefore the Program Director will prepare biannual Progress Reports on each student and make these available to the Steering Committee when requested.

VII. Stipend Policies

The MIP Department will not provide tuition or stipend assistance to students in the Masters of Science (professional) Program. Students are encouraged to pursue financial aid, or other grant/fellowship opportunities to assist them in their graduate education.

VIII. Graduation Requirements

All graduation requirements generally follow those outlined in the current Graduate and Professional Bulletin. It is the responsibility of each student to know and meet all of the requirements of the Graduate School.

A minimum of 30 semester credits (300 level or above) in coursework is required; 16 credits will be track-specific core courses 500 level or above. A scholarly paper will be required of each student as a requirement for the degree. The content and style of the paper will be determined by the Masters of Science (professional) Graduate Committee as described in Section X.

IX. Courses Required for the Professional Masters Degree

The Program currently has a single track for students in the Program. In future years, multiple tracks may be developed for the Masters of Science (professional) Program in order to address the base course needs relative the student's desired specialization.

The following set of courses has been designed specifically for the Microbiology Masters of Science (professional) Program. These have not simply been adapted from existing curricular offerings as may be found in other programs, but have been purposefully designed to meet the needs of our Professional Masters students:

MIP611 Advanced Laboratory Techniques – Theory and Practice 4 Credits

The 21st century microbiologist requires a working knowledge of an ever-growing arsenal of techniques in order to be an effective experimentalist as well as to understand the current literature. This course will provide graduate students with an in depth understanding of a wide array of techniques that are commonly used to investigate the cell and molecular biology of infectious diseases.

MIP613 Applied Microbiology and Virology – 4 credits

This course will deliver fundamental principles in the discipline in an applied, problem-solving fashion for applicability to the real world. Topics to be covered include practical aspects of viral vector design, fundamental biomanufacturing principles, drug screening, microbes in food and fuel production, etc.

MIP612 **Applied Immunology – 3 credits**

This course will cover practical/applied aspects of immunology. Emphasis will include immunological assays used in real world situations, preparation of designer antibodies, cytokines as drugs and targets, etc.

MIP617 **Principles of Biodefense and Emerging Pathogens – 3 credits**

This course will provide students with a detailed overview of pathogens of biodefense importance as well as emerging agents. It is designed to provide a cutting-edge analysis to extend a student's fundamental knowledge on microbiology into modern, applied areas.

MIP616 **Modern Molecular Biology** - 4 credits

This course is designed to provide students with a strong working knowledge in the theory and application of modern molecular biology approaches. These include (but are not limited to) genomics, proteomics, transcriptomics, etc.

MIP614 **Medical Microbiology – 3 credits**

This course is designed to provide an advanced treatment of the key biological and pathological ramifications of microbes that are important to human medicine. It will be designed to parallel similar courses given at professional medical schools.

MIP540 **Biosafety in Research Laboratories – 2 credits**

Practical applications of biosafety principles, including lab practices and regulatory aspects of research involving infectious microorganisms and rDNA.

- MIP654 **Research Policies and Regulations** – 1 credit
This course will cover the responsible conduct of research and discuss policy, regulatory, and ethical issues of particular interest to our Professional MS students.
- MIP618 **MIP MS-B Seminar Series** - 1 credit
This course is designed to give students the opportunity to hone their communication skills that are vital to their future success. This course will be offered (and required to be taken) both semesters.
- MIP619 **MIP MS-B Topics** – 2 credits
This course is designed to be delivered both in the Spring and Fall semesters to provide students with a forum for reading and discussing advanced scientific papers – as well as for issues of career interest. Importantly, this course will also bring together all of the participants in the program on a regular basis to allow for networking, discussions with the Program Director and build cohesiveness into the program.

X. Guidelines for the Scholarly Paper Associated with the MIP Masters of Science (professional) Degree

Submission of a scholarly paper is required to complete the MS-B program. The scholarly paper can be presented as either a 3000+ word review of the scientific literature in a scientific area related to the MS-B Program or an NIH R21-style grant application on a topic related to the MS-B Program (at the discretion of the Program Director). The paper will be due approximately 1 week before the end of March (dates vary each year), and will be reviewed by the Graduate Committee prior to acceptance.

XI. Student Appeals on Grading Decisions

Students have the right to appeal grading decisions as outlined in the Graduate Bulletin. Briefly, in all cases, the burden of proof rests with the student to clearly demonstrate that the grading decision was made on the basis of at least one of the following conditions:

- A grade was assigned on some basis other than performance (with the exception that grades given as a penalty for academic dishonesty)
- A grade was assigned on unique standards that did not apply to other students
- A grade was assigned based on a substantial unannounced departure from previously articulated grading standards

All appeals must be made in writing to the Steering Committee and must be received within 30 days of the start of the next regular semester. If no appeal is received within this prescribed time period, then the original grade will be considered final. Upon receipt of the appeal, the Steering Committee will render its decision in writing to all parties involved. All decisions by the Steering Committee on these matters will be considered final.