

STUDENT HANDBOOK

MASTER IN SCIENCE IN
CLINICAL AND APPLIED MASS SPECTROMETRY
GRADUATE PROGRAM

2022-2023

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Programs, Policies, Requirements and Philosophy

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1. GENERAL DESCRIPTION

The MS program in Clinical and Applied Mass Spectrometry (MS-CAMS) is a unique program that is tailored to industry standards, and will train students in the theory and hands-on application of mass spectrometry. This specialized technology is applicable to a variety of career paths that include academic research, clinical laboratory analysis and pharmaceutical and biotechnology industries.

In addition to acquisition of knowledge, students obtain employable skills that are becoming increasingly sought after in the industrial and academic fields today. The mastery of Mass Spectrometry will prepare the students for careers immediately upon graduation. The goal of the Clinical and Applied Mass Spectrometry graduate program is to produce capable, high quality experts in the field of Mass Spectrometry. By the end of the program, students will have attained, 1) a broad background knowledge in the scientific field of proteomics using mass spectrometry technology. 2) a theoretical understanding of physics and chemistry relevant for mass spectrometry. 3) a broad knowledge of the latest instrumentation, methodology and data analysis tools for using mass spectrometry in a variety of basic science, clinical science, and industry applications, and 4) valuable hands on training in sample preparation and usage of instrumentation.

2. Master of Science Program Requirements

There is a total credit requirement for the MS degree of 30, with 20 didactic courses and 10 research credits. Students will take courses in Theory and Physics of Mass Spectrometry (4 credits), Chemistry of Protein Separation (4 credits), Introduction to Mass Spectrometry Instrumentation (2 credits), and their first laboratory rotation (5 credits), in the first semester, for a total of 15 credits.

The remaining 15 credits will be taken in second semester. These include Computation and Bioinformatics for Proteomics (3 credits), Clinical Considerations and Biomarker Development (3 credits), Advanced Approaches for Mass Spectrometry (2 credits), a Proteomics Capstone Design Project (2 credits), and their second laboratory rotation hours (5 credits). This will result in a total of 15 credit hours for the second semester, bringing the total to 30 for the year.

Through a didactic online course, students will have access to lecture materials and resources. During the first semester, this content will provide students with the theoretical knowledge of Mass Spectrometry that will help to prepare them for their first hands-on laboratory rotation at the conclusion of the fall semester. During the second semester, online courses will further develop knowledge of analysis and application of mass spectrometry in order to prepare students for their second hands-on laboratory rotation at the conclusion of the spring semester.

A. Semester 1

The didactic courses will each be assessed through:

- 1) Exams (50%),
- 2) Weekly quizzes (25%),
- 3) Case study problem solving sessions (25%).

The laboratory rotation will be assessed through:

- 1) Laboratory reports (50%)
- 2) Attendance and use of good laboratory practices (25%)
- 3) Quality of sample preparation (25%)

B. Semester 2

The didactic courses will be assessed through:

- 1) Midterm and final exams (50%)
- 2) Weekly quizzes/homework (25%)
- 3) Case study problem solving sessions (25%)

The Capstone Design Project will be assessed through:

- 1) Written research proposal (75%)
- 2) Oral presentation of Capstone Project (15%)
- 3) Participation in advisory meetings (10%)

The laboratory rotation will be assessed through:

- 1) Laboratory reports (50%)
- 2) Attendance and use of good laboratory practices (25%)
- 3) Quality of data output (25%)

3. EXPECTATIONS FOR ALL STUDENTS

A. Academic Standards

To ensure that students receive a high-quality graduate education, the Physiology program rigorously maintains the following academic standards. Students are expected to maintain a graduate grade point average (GPA) of 3.0 or greater to be in good academic standing. Students who fail to maintain a GPA of 3.0 will be on probationary academic status. Students will be notified in writing by the Dean of Graduate School and the Graduate Program Director when placed on academic probation. The Physiology graduate program will provide students on academic probation one semester to raise their GPA above the 3.0 minimum. Failure to meet this academic standard will result in dismissal from the graduate program.

Physiology students are expected to do exceptionally well (grade of A or B) in their core courses. Students who receive a grade of “C” in any of the required core courses may be required to take that course over or prove proficiency in a remediation exam. The graduate program committee will decide which course of action the student will pursue.

B. Academic Honesty

The graduate school promotes the concept of academic honesty for students and faculty alike and a statement to this effect is incorporated into the LUC Graduate School Statement on Academic Honesty. This policy states:

“Academic honesty is an expression of the ethic of interpersonal justice, responsibility and care, applicable to Loyola University faculty, students and staff, which demands that the pursuit of knowledge in the university community be carried out with sincerity and integrity. Academic dishonesty is characterized by the failure to apply this ethic, i.e., any action whereby faculty, student or staff misrepresents the ownership of academic work submitted in his or her name”.

Student failure to practice academic honesty will, depending on the seriousness of the misconduct, result in a sanction ranging from up to a grade of “F” for the assignment to expulsion from the university. Channels for resolution of questions regarding such behavior will originate with the faculty (the course director or mentor) and the student and will extend to the department and graduate school if deemed necessary. The academic grievance procedure is detailed in the Graduate School Handbook (available at the LUC Graduate School office).

C. Vacations and Time Off

We support a healthy work ethic and encourage students to make time for the mental and physical well-being. However, we also stress that the highly competitive nature of foundational scientific research means that hard working and highly motivated

individuals achieve their goals. Furthermore, timely completion of the M.S. program requires substantial commitment, time, and effort. Thus, students owe it to themselves not to procrastinate and prolong their graduate careers.

Vacations and time off must be scheduled so that it does not conflict with required course work or program progress.

D. Leave of Absence

Official leaves of absence are intended for students who wish to discontinue temporarily their graduate studies due to special circumstances (e.g., medical, personal or professional reasons). Students who are on a leave of absence may not use University resources. A leave of absence postpones all deadlines concerning completion of degree requirements for the duration of the leave of absence. A student requesting a leave of absence is to complete a Leave-of-Absence form.

Leaves of absence are limited to a period of one full academic year without renewal.

In order to be reinstated to active status, the student must notify the Graduate Program Director in writing upon returning from a leave of absence. The student must return to active status in the semester following the expiration of a leave of absence; failure to do so may result in dismissal from the program. If a student's leave of absence starts after the semester has commenced, the student may come back at the beginning of the semester and may retake all classes again. The grades and quizzes earned by the student prior to the leave of absence will remain on record (the student will only have to take the exams and quizzes that s/he did not have the chance to take before).

E. Conflict Resolution

As in any community of individuals, interpersonal conflicts and/or disagreements may arise and must be resolved in an efficient and predictable fashion. Students should seek conflict-disagreement resolution in the following order. Student should first attempt to resolve the problem with the help of their thesis advisor. If the problem is not resolved satisfactorily, the student should seek resolution with the help of the graduate program director, his/her Thesis committee, and then the Departmental chairperson. If a satisfactory resolution is still not attained, then the student may appeal to Dean of the Graduate School to resolve the conflict.