

GUIDE TO SPECIAL MASTER'S PROGRAM
for
Department of Microbiology & Immunology Employees
University of North Carolina at Chapel Hill

The Special Master's Program for employees in the Department of Microbiology and Immunology enables laboratory employees to pursue a Master's degree on a part-time basis while working full-time in the Department. The faculty member in whose laboratory the employee works will normally be his or her research advisor, and must agree to the employee's participation in the program. The Special Master's program is designed to help research technicians increase their level of participation in and contribution to the scientific activities of their current laboratories. The M.S. degree also provides an important credential for employees who wish to become competitive for higher level technical positions or to move into new career directions.

The M.S. degree earned by students in the Special Master's program is a terminal degree, and it is important for prospective students in the program to understand that participation in this program is not an entrée into the Ph.D. program of the Department. Furthermore, prospective students intending to apply to Ph.D. programs would be better served focusing their efforts on research rather than coursework, because research is the primary basis of admissions decisions for Ph.D. programs. Finally, prospective students should be aware that any courses used to earn a M.S. degree will not be double-counted for credit toward a UNC MCRO Ph.D. degree.

Successful completion of the M.S. degree in this program requires a considerable commitment of time and energy over the forty hours per week expected of a laboratory technician. Time spent in class, attending seminars, and studying for and taking examinations is over and above the forty hours per week that is owed to the advisor/employer as a technician. When a student starts working on the thesis project, a portion of the research may be done during the regular work week if the advisor/employer agrees to that arrangement. However, whenever a student is registered for "Research in Microbiology (MCRO 901)," the student is expected to spend additional time in the lab working on the thesis project, beyond the regular work week. Even when a student is not officially registered for MCRO 901, it may often be necessary to spend additional time in the laboratory working on the thesis research project; students should be prepared to spend this additional time.

While much of the required coursework can be taken under the tuition waiver program for full-time employees of the University, it is not possible to complete the M.S. degree in a timely manner without paying any tuition. During semesters when a student takes two courses or takes a formal course plus research credits, the student will receive a tuition waiver for one of the courses and will have to pay tuition for the other one. Most students end up paying tuition for two courses, at the in-state tuition level, in order to complete their degree requirements.

Most students take around three years to complete the requirements for the M.S. degree under the auspices of this program. While it is technically possible to complete the degree in as little as four semesters of part-time study, such a timetable requires an extraordinary commitment of time and effort to the program.

A. Graduate School Requirements for a M.S. degree:

1. At least 30 semester hours of graduate credit, with at least 24 hours in graduate courses, and at least 3 hours of Master's Thesis. 6 hours of credit can be transferred from the Extension Division, in partial satisfaction of the 30 hour requirement.
2. Two semesters of residence credit, which can be accumulated in part-time study.

9 hours = 1 semester of residence credit; 6-8 hours give 1/2 semester of residence credit; 3-5 hours give 1/4 semester of residence credit. Thus, if a part-time student took 3 credits of coursework every semester, it would take 8 semesters to accumulate the two semesters of residence credit (8 semesters x 1/4 residence credits per semester = 2 residence credits). In order to complete the program in the target time of three years or less, it will be necessary for a part-time student to register for at least 6 credits for at least 2 semesters. Full-time students will have satisfied this requirement at the end of the first year of graduate study.

3. Written or oral comprehensive exam.
4. There is a five-year time limit for completion of all degree requirements.

B. Applying to the Special Master's Program:

1. To be eligible to apply to the program:
 - a. A technician must have at least one year of full-time laboratory employment with a faculty member of the department. Technicians working for faculty who do not have an appointment in Microbiology and Immunology (either primary or joint) are not eligible for this program, because the technician's employer also serves as the research advisor and the department requires that research advisors of departmental graduate students must be members of the department.
 - b. He or she must also have completed at least one graduate course offered by this Department or approved by the Graduate Advisor for the program (currently Miriam Braunstein), receiving a grade of H or P.
 - c. The technician's employer must agree to his or her participation in the program and agree to serve in the capacity of research advisor.
2. To apply, obtain a standard paper application for admission to the Graduate School from Student Services Specialist Jamie Desoto (jamie_desoto@unc.edu, 6009 Marsico Hall, 919-966-9005). At present, it is not possible to use the online

application system for this program, so return the complete application to Jamie. On the upper left corner of the first page of the application, write the words "SPECIAL MASTER'S".

3. Required elements of the application include:

- a. Transcripts from UNC Chapel Hill and undergraduate institution(s).
- b. A written statement of purpose that describes the applicant's research experience and interests, and the reason why he or she is interested in the program.
- c. A curriculum vitae.
- d. Three letters of recommendation, one of which must be from the applicant's current employer, who will act as the student's research advisor for the M.S. program. The letters of recommendation must be sent directly from the letter writer to the Student Services Specialist and not be supplied by the applicant.

Standardized test scores are neither required nor considered.

4. Applications will be evaluated by a M.S. admissions/advisory committee consisting of three faculty members.
5. Students may apply to begin the program in either the Fall or Spring Semester.
6. Application deadlines: May 15 for admission starting in the Fall semester
September 15 for admission starting in the Spring semester

C. Specific Departmental Requirements for the M.S. Degree:

The requirements for a Department of Microbiology & Immunology M.S. degree closely follow all requirements for a Ph.D. degree, with the following exceptions:

- MCRO795 is not required
- The minimum seminar attendance requirement is lower.
- There is no Teaching Assistant requirement.
- The preliminary examination format is substantially different.
- There is no minimum publication requirement.
- The scope (but not the quality) of thesis research expected is less for the M.S. than for the Ph.D.

In general, any changes in requirements, procedures, expectations, etc. made for Ph.D. students will also apply to M.S. students.

1. **Courses.** A minimum of six graduate level courses, at least two of which must be seminar/tutorials. At least one of the seminar/tutorials must be MCRO710, MCRO711, or MCRO712. To qualify for seminar/tutorial credit, another course must be 700 series or higher, based on discussion of the primary literature, and

approved by the Graduate Student Advisor. MCRO901 (Research in Microbiology) does not qualify as one of the six courses for fulfilling this requirement.

2. **Seminars.** Students will audit MCRO702 each semester and must meet the attendance requirements, but will not formally register due to tuition implications. The student must attend at least one-third of the weekly departmental and student seminars. Students are expected to give an annual student seminar, starting in their second year in the program.
3. **Written preliminary examination.** A two-day written exam with essay-type questions; the student may choose beforehand whether the exam will be closed-open-book, and the questions are designed accordingly. The exam is taken when the student has completed all or most of the planned course work, at a specific time chosen by the student, with approval from the research advisor. The questions are drawn from areas covered by the course work the student has taken and from his or her area of research. The student's advisor will be responsible for soliciting questions from the members of the thesis committee and for assembling the exam (detailed instructions for the comprehensive exam are contained in the document entitled "Frequently Asked Questions about the Comprehensive Exam for Students Pursuing a Master's degree in Microbiology and Immunology", available from Bob Bourret or Jamie Desoto). Generally, each committee member writes two questions designed to be answered in approximately 2-3 hours of thinking and writing, and the student must answer at least one of the two questions from each committee member. It is important that the committee members design their questions such that generative AI programs such as ChatGPT cannot successfully answer the question, and confirm that fact. An exam for a student with a four-member committee will usually contain eight questions; the student will be required to answer four, or possibly five, of the questions. Committee members grade the answers to the questions that they wrote, using a scale of H, P+, P, P-, L, or F. A student who does not pass the written preliminary exam may take it a second time, after waiting at least three months. If the student does not pass the exam on the second attempt, the student will not be eligible to continue in the program.
4. **Thesis committee & chair.** As soon as possible after entering the Master's degree program, the student should choose a thesis committee of four faculty members (including the research advisor). At least three committee members must have faculty appointments in our department. A committee chair, different than the research advisor, should also be chosen. For students in the Special Master's program for departmental employees, it is useful to have an initial meeting with the committee during the first or second semester in the program.
5. **Thesis project approval.** Once the student has defined a thesis research project, he or she writes a brief thesis proposal and then meets with the committee to discuss and defend the planned research. At least one week prior to meeting, provide the thesis committee with a written document of two pages or less describing hypotheses, Specific Aims, and a brief overview of research design,

including which parts of research design have been completed. For part-time students in the Special Master's program, this thesis project approval meeting should occur no later than during the third semester in the program.

6. **Thesis committee meetings.** Meet at least annually with the thesis committee. Provide the committee with a progress report at least one week prior to each meeting. The report consists of a Specific Aims page followed by a description of progress to date organized by Aim. The report should include any changes in Aims, a summary of key results, plans for future experiments, and the status of any publications.
7. **Thesis research.** The main difference between a Master's thesis project and a doctoral dissertation project is one of scope; the research should be of similar quality and significance in both cases. The goal for the scope of the M.S. thesis project is that it should comprise a body of research that is appropriate for publication as an article in a refereed journal with the student as the first author.

The thesis research must involve an independent project appropriate for a graduate student, rather than just functioning as a technical assistant. The regular working hours that can be devoted to the project, and the relationship of the project to the student/employee's other work, must be approved by the advisor. The student may include in the thesis results that were obtained during regular working hours, as long as the advisor and thesis committee are satisfied that the student pursued the project in the manner expected of a graduate student. However, the thesis should not include work that was done before the student entered the Master's program. When a student is registered for MCRO901 (Research in Microbiology), the student should spend time in the lab working on the project, over and above the 40 hours/week of full-time employment. A good rule of thumb is that for 3 credits of MCRO901, the student should spend at least 10 additional hours a week in laboratory research or reading relevant to the project.

8. **Thesis.** A presentation, written by the student, of the results of the independent research project. It should be a description of a piece of publication-quality research. The goal is for the results of this project to be submitted for publication as all or a major part of a manuscript, with the student as the first author. The thesis will usually consist of multiple chapters: 1) A general Introduction to the project, review of the relevant literature, and discussion of the significance of the work; this chapter will include literature citations. 2) One or more chapters presenting the results of the student's research. Each chapter may be written in the format of a research paper, with Introduction, Materials and Methods, Results, Discussion, and Literature Cited sections. 3) A short overall Discussion, in which the student considers the work as a whole and discusses such topics as future directions or unanswered questions, is optional, depending on the wishes of the student's advisor and thesis committee. Each chapter in the thesis other than the Introduction and Conclusion must list all actual or planned authors involved in the described research and include a statement specifying the contributions of the student to the project.

9. **Distribution of thesis.** The student's research advisor must be satisfied with the thesis before it can be distributed to the other members of the thesis committee. Committee members must receive the thesis at least one week before the scheduled date for the defense. If a student cannot meet this deadline, the defense will be rescheduled for a time at least one week after the date that the thesis is distributed to committee members.
10. **Private defense and public seminar.** The final M.S. defense will take place in two stages:

First, a private defense in front of the thesis committee. The student should meet with the committee chair beforehand to discuss and agree upon general expectations for a brief initial presentation of no more than 10 slides. The presentation can include a synopsis of dissertation highlights, but should highlight broader or unresolved aspects of the thesis research and facilitate a forward-thinking conversation. The intent of the presentation is to help the committee assess whether or not the student has become a mature scientist. The committee will engage the student by asking questions arising from the presentation, the dissertation, and if applicable, peer reviews of a manuscript used to satisfy the publication requirement but not yet accepted for publication. If the student passes the defense, then all committee members, including the advisor and chair, will sign the appropriate graduate school document. The thesis committee chair will certify (by initialing the final exam form) that the dissertation has been approved for electronic submission at the time of defense if no edits are requested, or after any required edits are completed and approved.

Second, the student will present a public seminar of their research results no sooner than two weeks after their successful private defense. Thesis committee members are encouraged but not required to attend the public seminar. A final grade for Mcro993 will not be submitted until after the required public seminar.

A standard progression through the program would be expected to take approximately three years. The student will take one or two courses (or one course plus research credit) each semester, and probably take the comprehensive exam after two years. The third year would involve completing the research project, and writing and defending the thesis.

For further information about the program, or if you have questions, contact Bob Bourret, the Acting Special M.S. Student Advisor (6108 Marsico Hall; 919-966-2679; bouret@med.unc.edu).