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# Microbiology Fall Bulletin Addendum

## Master of Arts in Microbiology 2008

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Much of the pertinent information for Microbiology masters students is explained in the Fall Bulletin for Microbiology. There are however, a number of differences, which are highlighted in this addendum.

**Course Requirements:** The Masters degree requires that the student take a total of 30 credit hours in courses approved for graduate credit. Most of these credits will be in M800, which is credit for performing research. Masters students are expected to take 12 credits of coursework (this does not include M850 and M500 but does include Z620). The choice of courses is dependent on the background of individual student and thus the courses should be chosen in consultation with the Microbiology Program Director (Clay Fuqua in Jordan Hall 425E, 856-6005, cfuqua@indiana.edu). Available courses include, but are not limited to, the list below. Additional courses from this or other departments may satisfy the course requirements and require written permission of the Microbiology Program Director.

Masters students are expected to rotate (M500) in at least two laboratories during their first year.

### Fall semester

We recommend taking 6 credits of coursework, plus M850 for 1 credit, plus M500 (1-6 credits) to complete to 12 credits total.

M500	Research Rotation (1-6 credits)
M850	Microbiology Seminar (1 credit), register each semester, see below
B501*	Integrated Biochemistry (4.5 credits)
L585**	Molecular Genetics and Bioinformatics (3 credits)
C483	Biological Chemistry (3 credits)
C485	Biosynthesis and Physiology (3 credits)
M440	Medical Microbiology (3 credits)
M460	Biology of the Prokaryotes (3 credits)
M480	Microbial and Molecular Genetics (3 credits)
M430	Virology
Z620	Special Topics (Examples; Two-Component Regulatory Systems; Plasmids and Conjugative Elements and Conjugation)

\*Students who have not had Biochemistry or Molecular Biology or who consider their background in those areas to be weak may prefer to take C483 Biological Chemistry or C485 Biosynthesis and Physiology, instead of B501. Although C483 and C485 are formally advanced undergraduate courses, they carry graduate credit as well. Students who take C483 or C485, and then join labs with an emphasis on biochemical approaches, may elect to take B501 during the second or third year of graduate school as an Advanced Course.

\*\*Students who have not had Genetics or who have a weak background in Genetics are encouraged to take M480 Microbial and Molecular Genetics (undergraduate level but also carries graduate credit) their first year and L585 Molecular Genetics their second year.

## Spring Semester

We recommend that you complete your 12 credits of coursework for the degree. In addition, take M850 (1 credit) and M500 (1-6 credits) to complete 12 credits for the semester.

M850	Microbiology Seminar (1 credit), register each semester, see below
M416	Molecular Biology of the AIDS virus (every other year)
M430	Virology (3 credits)
M525	Microbial Physiology and Biochemistry (3 credits)
L586	Cell Biology (4.5 credits)
L321	Principles of Immunology (3 credits)
Z620	Special Topics (Examples; Protein Secretion in Bacteria, Molecular Virology and Public Health;)
M500	Research Rotation

**Microbiology Seminar (M850) requirement:** Microbiology Masters students must participate in the Microbiology Journal/Research Club, which meets Tuesdays at 12:20 PM during the Fall and Spring semesters. Students are required to register for M850 each semester, attend each meeting and participate as specified by the course instructor. Students in their thesis years do not have to register for M850 but must still attend the weekly seminar, attend practice talks as requested, and possibly give presentations.

**Faculty Mentor:** A faculty mentor will be assigned to each incoming graduate student. Our mentoring program is designed to offer every student an "advisor" prior to their settling into a thesis lab. Students will meet periodically with their mentor throughout the first year, and should consult with him/her if questions or problems with coursework or rotations arise.

**Grades:** Every student must maintain a minimum GPA of B (3.0) in order to remain in good standing. Courses to be counted toward the Masters degree must be passed with a grade of B- (2.7) or better.

**Rotations, Thesis Advisor and Advisory Committee:** Masters students must complete at least two rotations over the first year. These rotations will follow the same format as described for PHD students. After the completion of the rotations, the student identifies a thesis advisor from the "Microbiology Thesis Advisors" list and negotiates entry into the advisor's lab. Together with his/her advisor the student selects the other members of an advisory committee of three or four faculty appropriate to the student's degree. This advisory committee guides and monitors the student's subsequent independent work. Students are required to meet with their advisory committee in the Fall semester of their second year at the latest.

**Entry into a Research Laboratory:** By the end of the final rotation (may be as early as following Fall Rotation I for students who performed an early summer rotation), students determine their research lab and mentor. This is a negotiation process, in which the faculty and the students attempt to find a productive and appropriate fit. Students are not guaranteed positions in laboratories, although in practice this is rarely an issue. If students desire additional rotations, they may apply for these with the Microbiology Program Director. It is **very important** to note that entry into a research lab is a requirement for our graduate program, and students must have joined a lab by the beginning of their second year. Exceptions will be made in only the rarest of cases.

### **Thesis Options:**

*Research Degree:* Most students chose to pursue a masters degree based on results obtained from experimentation in the laboratory. In this option the students are required to write a thesis based on their results, which is approved by their thesis committee. The research thesis must be defended in a public research seminar and in a meeting of the research advisory committee.

*Literature Degree:* The department also offers a program in microbiology leading to a master's degree that does not require a laboratory research project. Enrolment in this program requires authorisation by the program director. A student enrolled in this program will write a thesis critically evaluating and reviewing some aspect of microbiology reported in the literature. All other requirements for the degree are identical to those stated above for the research-based Master of Arts.

### **Students transferring from the Ph.D. to the Masters in Microbiology:**

Transfer to the Masters in Microbiology from a Ph.D. program requires a written approval from the Microbiology Program Director. For Research Degrees, the thesis topic has to be in an area of microbiology and has to be approved by the Microbiology Program Director.

Students will have to meet the course requirements for the Masters degree prior to graduation. Some non-microbiology courses may be substituted for some of the Microbiology requirements with written approval of the Microbiology Program Director. The duration of departmental support must also be negotiated with the Director of Graduate Studies and the Microbiology Program director.

### **Procedure and requirements for transfer from the Masters in Microbiology to the Ph.D.:**

Acceptance into the M.A. program is not a guarantee of acceptance into the Ph.D. program. Therefore, the request to transfer from the Masters in Microbiology Program to a Ph.D. program must be made in writing to the appropriate Graduate Admissions Committee (MBG, EEB, or Biochemistry). The student may request to transfer to the Microbiology Ph.D. program or to another Ph.D. program within the Department of Biology.

The student must satisfy the following requirements:

1. The student must be at least in the second semester of their first year in the Microbiology Masters degree at the time of the request
2. The student must have had at least one meeting with their Thesis Advisory Committee
3. The student must be on-track to have completed the course requirements of the Masters degree at the time of transfer. However, the student may have an Incomplete grade in M850.

If the student wishes to continue his/her research in their current laboratory, an evaluation of the suitability of the transfer to the Ph.D. program must be provided by the student's Thesis Advisory Committee. This evaluation can be in the form of a Committee Meeting report and must state whether the student has made good progress towards his/her thesis research. A recommendation for transfer to the Ph.D. from the committee should indicate that the student has demonstrated that he/she is capable of functioning at the level of the Ph.D. both intellectually and technically.

In addition, the request for transfer must contain the following:

1. A letter requesting the transfer.
2. A statement of purpose

3. Official transcripts
4. Three letters of reference. One of these letters must be from the Masters Thesis Advisor and must indicate if the student can pursue their Ph.D. thesis research in their laboratory, if applicable.

If the request to transfer is granted, the letter of admission to the Ph.D. should indicate the following:

1. The courses taken for the Masters degree that satisfy the Ph.D. requirements may be counted towards the Ph.D.
2. If the student elects to pursue the Ph.D. thesis in their Masters advisor's laboratory, and on the condition that the current advisor supports this request, the requirement for additional rotations will be waived, as long as the student has completed the two rotations required for the Masters.
3. If the student is considering moving to another laboratory, he/she will be required to complete the Ph.D. requirement for three rotations. Rotations completed for the Masters degree can be counted towards this requirement.
4. The timing for the Preliminary Exam must be indicated. The student should have at least one year after the transfer to the Ph.D. degree before being required to take the Preliminary Exam.
5. The amount, mechanism and duration of support must be indicated

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## Microbiology Thesis Advisors

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Carl Bauer	Regulation of photosynthesis; biosynthesis of chlorophyll; phototaxis
Jim Bever	Ecology and evolution of plants and fungi
Yves Brun	Mechanisms and regulation of bacterial cell division and differentiation
Lingling Chen	Structural studies of molecular chaperones and quorum sensing
Keith Clay	Plant ecology, plant/fungal and invertebrate/microbe interactions
Pranav Danthi	Molecular biology of reoviruses – cell death and disease
Jim Drummond	Biochemistry of DNA repair and metabolism
Pat Foster	Mutagenesis, DNA replication, and recombination
Clay Fuqua	Mechanisms and consequences of microbial interactions
David Giedroc (C)	Metal biochemistry and RNA structure/function
Richard Hardy	Genome functions of RNA viruses and the roles of trans-acting factors
Ke Hu	Apicomplexan parasites and cytoskeletal biogenesis
Roger Innes	Molecular genetics of plant/pathogen interactions
David Kehoe	Molecular genetics of light-regulated signal transduction
Daniel Kearns	Bacterial multicellular behavior
Melanie Marketon	Pathogenesis and host cell interactions of <i>Yersinia pestis</i>
Tuli Mukhopadhyay	Structure and assembly of enveloped, RNA viruses
David Nelson	Chlamydial virulence and immune response
Jeff Palmer	Molecular evolution; origin and evolution of introns and organelle genomes
Flynn Picardal (S)	Environmental microbiology, biogeochemistry, and bioremediation
Rich Phillips	Biogeochemical consequences of plant-soil-microbial interactions
Heather Reynolds	Plant community ecology; plant-microbe interactions
Sidney Shaw	Microtubule dynamics and organization in acentriolar <i>Arabidopsis</i> cells
Gregory Velicer	Sociobiology of myxobacteria
Malcolm Winkler	Molecular mechanisms of bacterial pathogenesis
Miriam Zolan	Meiosis and DNA repair

C = adjunct with Chemistry

S = adjunct with School of Public and Environmental Affairs