

M.S. in Microbiology and Cell Science Academic Assessment Plan 2012-2013

College of Agricultural and Life Sciences
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Office of the Provost

*University of
Florida*

*Institutional
Assessment*

*Continuous Quality
Enhancement*

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2012-2013 Academic Assessment Plan for M.S. in Microbiology and Cell Science

College of Agricultural and Life Sciences

A. Mission

The mission of the Department of Microbiology and Cell Science at the University of Florida is to generate new knowledge in microbial, molecular, cellular, and computational biology and extend our knowledge to undergraduate and graduate students as well as the general public. We always strive to conduct competitive and state-of-the-art science in many of today's important biological problems. We pride ourselves in the diversity of our faculty, student body, and curriculum. Our curricula at the graduate and undergraduate levels are intended to prepare our students for positions in academia, biomedical sciences, industry, and government. We foster and encourage collaborations with other units at UF as well as with other scientists at many institutions around the world.

The Microbiology and Cell Science graduate program supports the missions of the college and university to serve the nation's and state's critical needs by contributing to a well-qualified and broadly diverse citizenry, leadership and workforce through graduate education and to expand our understanding of the natural world, the intellect and the senses through graduate student research.

B. Student Learning Outcomes and Assessment Measures

SLO Type	Student Learning Outcome	Assessment Method	Degree Delivery
Knowledge (1)	Describe in writing and orally, the molecular genetic, biochemical and cellular basis of life	1) Evaluation of the student's Program of Study by the Supervisory Committee using a faculty-developed rubric; 2) Evaluation of the thesis defense or technical report/project and by the Supervisory Committee using a faculty-developed rubric.	Campus
Skills (2)	Discuss orally and in writing, research methodologies for applying the scientific method to the generation of new knowledge.	Evaluation of the thesis defense and the preparation of a manuscript for publication in a peer-reviewed journal or the technical report/project by the Supervisory Committee using a faculty-developed rubric (M.S. thesis). Evaluate technical report and comprehensive oral examination by the Supervisory Committee M.S. nonthesis degree). (See Appendix for rubrics)	Campus

Professional Behavior (3)	Interact with professional peers with honesty, ethical behavior, cultural sensitivity, teamwork, and effective communication.	1) Consistent adherence during the degree program to the UF Honor Code; 2) Observation by faculty of professional behavior during class activities, seminars, journal colloquia, research work, thesis defense (or project report) and participation in professional societies. These observations will be shared with the Supervisory Committee and evaluated using a faculty-developed rubric.	Campus
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C. Research

Graduate students are involved in research activities throughout their studies, starting with attendance of our annual departmental research retreat, where new students meet faculty and other graduate students, attend talks and poster presentations and receive instructions on submitting research proposals and related topics. The M.S. candidate pursuing the thesis option will conduct original research under the guidance of the major professor and the M.S. thesis committee, which will consist of the major professor and two other faculty members who have U.F. Graduate Faculty status, to be chosen by the student and major professor. The student is required to prepare a thesis that documents independent investigation in the chosen research field. The committee shall meet regularly, at least annually, to assess the student's progress. Degree completion requires that at least one manuscript, based on the student's research, shall be submitted for publication in a refereed scientific journal. A copy of the thesis is to be provided to the department.

The student must present a departmental seminar of the thesis research to be immediately followed by an oral defense administered by the individual supervisory committee. The style and format of the thesis must adhere strictly with the rules and abbreviations described in "Instruction for Authors" published in the Journal of Bacteriology or another approved journal. At the student's option, reference citations within the text may be in the form of (author and date) rather than the usual reference number format. This will greatly facilitate changes, which may be suggested by the student's committee. If there is any conflict, the format, typing and positioning requirements of the Graduate School Guide take precedence over the journal specifications.

D. Assessment Timeline

M.S. in Microbiology and Cell Science

College of Agricultural and Life Sciences

Assessment SLOs	Program of Study Review	Thesis Defense or Technical Project	Annual Evaluation
Knowledge			
#1	X	X	
Skills			
#2		X	
Professional Behavior			
#3			X

E. Assessment Cycle

Assessment Cycle for:

M.S. in Microbiology and Cell Science

Analysis and Interpretation:

Program Modifications:

Dissemination:

College of Agricultural and Life Sciences

May-June annually

Completed by September 1 of each year

Completed by September 1 of each year

SLOs	Year	12-13	13-14	14-15	15-16
Content Knowledge					
#1		X	X	X	X
Skills					
#2		X	X	X	X
Professional Behavior					
#3		X	X	X	X

F. Measurement Tools

The individual rubrics used as measurement tools are shown in the Appendix.

SLOs are assessed on a continuing basis initially in the classroom and in the research laboratory. Classroom assessment in various courses is reflected in the course grade. SLOs in the laboratory are assessed by the students' major professor who is interacting with the student daily. In addition, progress in SLOs is reflected in a seminar the student presents to the entire department on her/his research once a year. The student's performance in research and the ability to orally present and defend her/his research up to that point is evaluated by the faculty members of the department during this time. The student also presents her/his research in a mini-symposium held just before the beginning of the Fall semester of each year and again the student's overall performance is evaluated by all the faculty members of the department. These evaluations of the SLOs are used to track the progress of the student through the academic career by the major professor and other faculty members of the department. The major professor addresses any concerns with the student and attempts to help the student overcome any limitations. The student's supervisory committee meets with the student at least once a year and further evaluates the student's progress in all three areas of SLOs. Before graduation, an exit seminar to the entire department and her/his defense of thesis along with a published manuscript based on research or a yet to be published manuscript serve as the ultimate evaluation of the SLOs.

The student's Program of Study is reviewed by the major professor and the supervisory committee to determine that all required coursework is included and to tailor the choice of elective courses to support the area of emphasis of the student's research project and career goals.

Evaluation of professional behavior is documented at the end of every semester in a written evaluation by the major professor and during the graduate committee meetings, which are held at least annually.

Evaluation of the student's knowledge of our field, research methodology and skills, and progress toward degree completion is formally assessed at least annually during committee meetings.

The thesis defense (thesis students) provides a final opportunity for the supervisory committee to evaluate the student's understanding of molecular, genetic, biochemical and cellular bases of life and to document level of competence in research methodology and preparation of a manuscript.

Evaluation of the technical report/project and comprehensive exam (non-thesis students) provides a final opportunity for the supervisory committee to evaluate the student's understanding of molecular, genetic, biochemical and cellular bases of life and to document level of competence in research methodology and preparation of a technical report or manuscript.

G. Assessment Oversight

The student's major professor is the first line of assessment of the Student Learning Outcomes. Oversight of the process and outcomes is by the committee members listed below.

Name	Department Affiliation	Email Address	Phone Number
Tony Romeo, Graduate Coordinator	Microbiology & Cell Science (MCS)	tromeo@ufl.edu	352-392-2400
Claudio Gonzalez	MCS	cfgonzalez@ufl.edu	352-273-8088
Nemat Keyhani	MCS	Keyhani@ufl.edu	352-392-2488
Peter Kima	MCS	pkima@ufl.edu	352-392-0384
Julie A. Maupin	MCS	jmaupin@ufl.edu	352-392-4095
Wayne Nicholson	MCS	wln@ufl.edu	321-261-3773
James F. Preston	MCS	jpreston@ufl.edu	352-392-5923
Kelly Rice	MCS	kcrice@ufl.edu	352-392-1192
K. T. Shanmugam	MCS	shan@ufl.edu	352-392-2490

H. Appendix

Rubric for Use in Assessing the Program of Study in Microbiology and Cell Science (SLO 1)

To be used by the graduate student in conjunction with the major professor and degree committee.

Yes

No

All courses required for the student's program are included & credit hours meet graduation requirements.

Elective courses important for the student's research emphasis and long term career goals are included.

Rubric for Use in MCS Graduate Student Committee Meetings (SLO 1, 2)

Satisfactory

Needs improvement

Unsatisfactory

Understands and communicates the questions and hypotheses of the project.

Describes the approach and methodology, including the strengths & limitations thereof, in sufficient detail.

Provides an organized update of results and progress made since the prior committee meeting.

Answers questions in an informed, thoughtful, and professional manner.

Understands and communicates the short and long range goals of the project.

Rubric for Use in Semester Evaluation of MCS Graduate Student by Major Professor (SLO 1-3)

	Always	Usually	Infrequently	Never
Displayed diligence in the conduct of research, coursework, and/or teaching.				
Demonstrated ethical conduct and integrity in pursuit of research and other student activities.				
Interacted respectfully and professionally with others in the laboratory, department, university and at meetings.				

Rubric for Nonthesis M.S. Report and Comprehensive Exam in MCS (SLO 1-3)

Technical Report / Project

	Satisfactory	Needs improvement	Unsatisfactory
Abstract			
Statement of purpose			
Design of study			
Findings			
Importance			
Introduction/Background			
Coherence			
Comprehensive treatment			
Current information			
Analytic			
Thematic			
Methods, Procedures, Assumptions			
Appropriate for the project			
Limitations and strengths			
Clarity of presentation			
Sufficient analytical detail			
Results/Analysis			
Aligned with purpose			
Sophistication			
Clarity of presentation			
Interpretations and insights			
Summary / Conclusions			
Refers back to statement of purpose			

Ties everything together
Presents broader perspective
Implications/applications
Future directions

Comprehensive oral exam (Committee of at least 2 members)

	Satisfactory	Needs improvement	Unsatisfactory
Basic biology of microorganisms/cells			
Student understands and discusses fundamental knowledge base of microbiology and cell science.			
Cell structure and function			
Physiology and Metabolism			
Genetics, Genomics, Molecular Biology			
Special emphasis area			
Understanding of topics encompassed in the subdiscipline of interest (For example, medical bacteriology, statistics and metagenomics, biotechnology.)			
Principles and concepts of the area.			
Important methodology of the area.			
Ability to answer questions & explain theoretical or empirical research in a coherent and organized manner.			
Attitude and personal conduct			
Awareness and engagement of personal integrity and ethical conduct relevant to research in general and emphasis area.			

Rubric for M.S. Thesis / Thesis Defense in Microbiology & Cell Science (SLO 1-3)

Satisfactory Needs Improvement Unsatisfactory

Thesis:

Abstract

Statement of purpose/question(s)

Hypothesis and design

Findings

Importance/Relevance

Literature Review

Comprehensive

Current

Contextualized

Analytic

Thematic

Concepts/Theory

Logical

Appropriate

Aligned with questions

Strengths/Limitations

Methods/Approach

Appropriate for questions

Sufficient evaluation & detail

Advantages/Disadvantages

Results/Analysis

Alignment with questions

Sophistication

Clarity of presentation

Interpretation and insights

Limitations

Summary / Conclusions

Refers back to Introduction

Ties everything together

Presents broader perspective

Implications, applications

Future directions

Oral Defense of Thesis:

Introduction: Delineates the key questions and hypotheses of the project.

Background information: Demonstrates sound knowledge of the literature of the research area. Appropriately selective.

Project approach: Describes use of methodology /technology in sufficient detail. Understands and explains the basis & interpretations thereof.

Findings: Results presented in a logical order. Implications and limitations discussed.

Summary: Findings are summarized in a clear and organized fashion, integrated into model(s), as appropriate.

Context: Student communicates the value of the research to the broader field (the molecular genetic, cellular and biochemical basis of life) and where appropriate, to relevant applications.

Response to questions: Addresses questions in direct and professional manner. Demonstrates mastery of the project area.

