

Major Assessment Findings and Curricular Improvements
Arts and Sciences/Department of Biology
Master's Program in Biology, in Biotechnology,
and in Clinical Laboratory Sciences
Doctoral Program in Cell and Microbial Biology
AY2008-09 through AY2012-13

Assessment Measures

The Department of Biology uses the following measures to assess departmental learning outcomes:

- Grades and enrollment totals for Methods in Biological Research (Biol 727)
- Grades and enrollment totals for Comparative Metabolism (Biol 774)
- Comprehensive exams
- Progression through the programs

Assessment Findings

Course Data (Attachments 1, 2)

The Department of Biology analyzed course grades and enrollment data in Biol 727 (Methods in Biological Research) [Attachment 1] and Biol 774 (Comparative Metabolism) [Attachment 2] for a five-year period (Fall 2008 through Spring 2013). These two courses represent 6 credits out of the 15 core course credits in the Master's Program and 6 credits out of the 20 core course credits in the Ph.D. program. Therefore, both courses are requirements for all of the students in the Biology graduate program. Additionally, they are the only two lecture (non-seminar based) courses that are populated exclusively by graduate students.

In the prior period of analysis (Spring 04-Fall 06), Biol 727 enrolled between four and five students in each of the three fall semesters. During the current period of analysis, Biol 727 enrolled between nine and fourteen students in each of the four fall semesters. These enrollment numbers represent between double and triple the number of students from the previous period of analysis. Out of 43 students enrolled in Biol 727 since fall of 2008, 41 of them (95%) were in the good to exceptional performance (B- to A+) range, with average grades ranging from 3.19 to 3.39 per semester. In two of the semesters, there was one student who received a C in Biol 727. In Biol 774 that is offered in alternate years, the course was taught twice during this period with an enrollment of 11 students in both Spring 2010 and Spring 2012. Over the period analyzed, 100% of the students were in the good to exceptional performance range, with average grades ranging from 3.31 to 3.43 per semester. The biology faculty as a whole reviews all C grades at the end of each semester. Any student, who earns three credit hours of C grades is placed on probation and closely monitored. The faculty discusses each such case in a faculty meeting, and the respective major professor meets with the student to pass on faculty recommendations. A student is subject to dismissal, if s/he earns more than six credit hours of C grades.

We attribute the relatively high grades in these two courses to two reasons: i) we admit students based on their strong past academic performance in BS/MS degree programs; thus the filter for high academic performance is applied at the stage of admission, so we expect our students to be able to perform at a high level, with C grades being the rare cases; ii) our biology faculty members are very devoted to teaching and accessible to students which leads to greater academic success.

Because these graduate courses are 700-level courses, they are not required to use the official university-sponsored course evaluations, particularly since their format is not well suited to that used for lower-level courses. Therefore, the instructors had developed course evaluation forms that were customized for the particular course and the data was not available for these assessment findings.

Milestone and Progression Data (Attachments 3, 4)

The major milestone in our graduate program is the Comprehensive Examination that is administered when graduate students have completed all of the required, but not necessarily the elective, courses in our M.S. and Ph.D. programs. In the past, we have had very low enrollment in our Masters of Biology program because most of our students matriculated into our Ph.D. program. So, our numbers for comprehensive exams and enrollment were too low to analyze. Beginning in Fall 2010, we introduced a Masters in Biotechnology program. This is a terminal degree so the majority of those students will be expected to graduate in 2 years. For example, of the 18 M.S. students who matriculated in Fall 2010 and 2011, 14 of those students (78%) graduated in 2 years. In addition, of the 16 students who took comprehensive exams 100% of them passed.

With respect to the Ph. D. program, 23 students entered during 2008-2012. The students typically took their comprehensive exams in the third or fourth year of study. Therefore, data from cohorts 2008-2010 were examined. Of the 9 students who entered the program during this time period, 7 passed their comprehensive exams by the end of fourth year. The other two students discontinued enrollment in the program prior to taking their comprehensive examination. Of the 7 students who passed the comprehensive exams, 2 students from the earliest cohort (fall 2008) graduated with their Ph.D. degrees and 5 of them are still working on their dissertations.

In our department, full-time students take 5-6 years to complete the Ph.D. program whereas the part-time students take 6-7 years, which is expected because these students are employed off-campus in full-time jobs while performing dissertation research that is independent of the employment. Most of the full-time students have teaching assistantships to support themselves financially while in the program. The time involved in TA duties also significantly impacts the time taken to complete dissertation research.

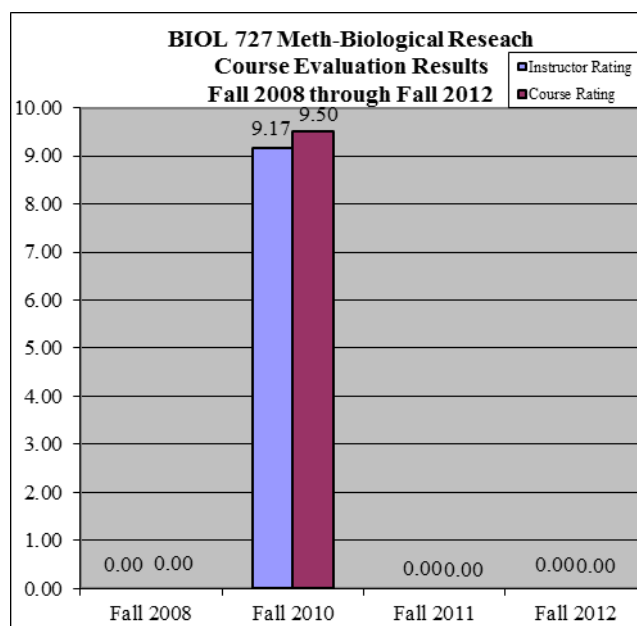
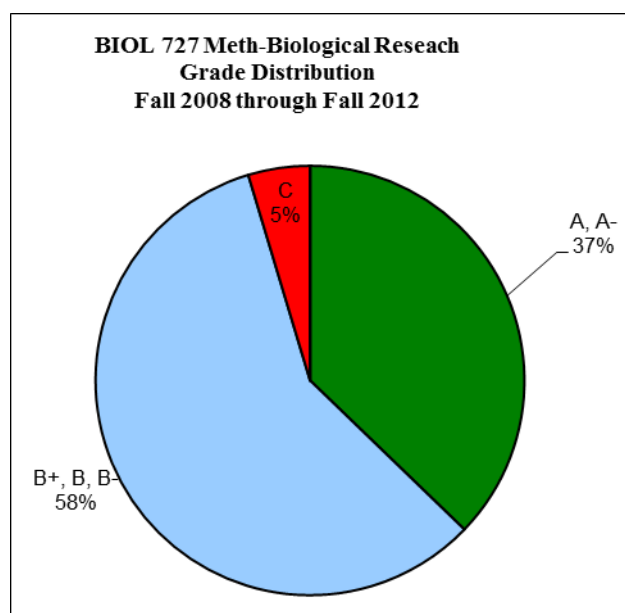
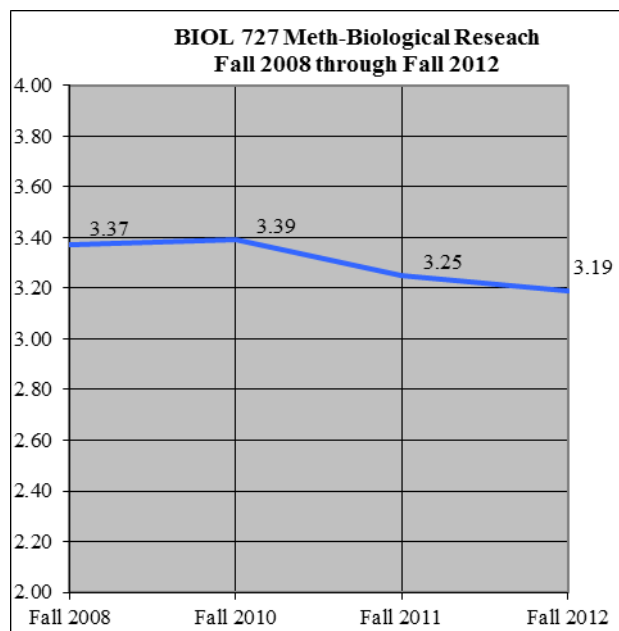
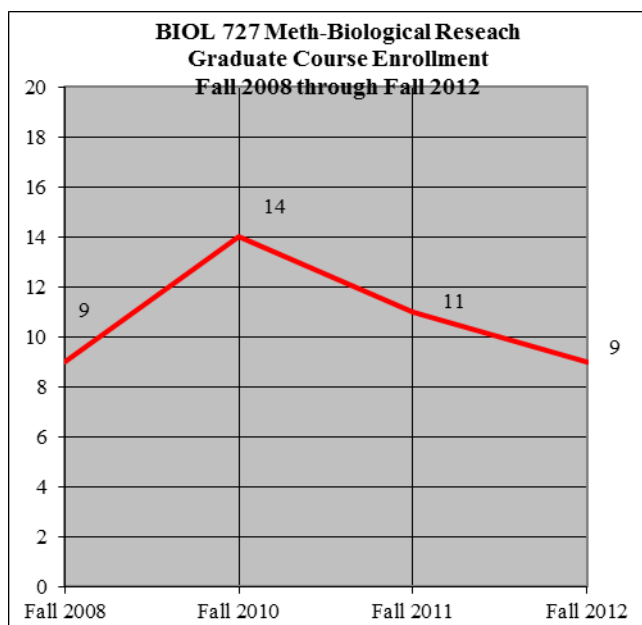
Curricular Improvements

Our department continuously monitors the academic progress of our students and their performance in both core and elective courses. We have particularly monitored the performance in the comprehensive exams and have designed student-specific Research Topics (Biol 765 and Biol 766) courses to address academic deficiencies on a case-by-case basis when students do not pass their comprehensive exams on the first attempt. Such a policy has kept the eventual passing rates of students in the Ph.D. program high.

In Fall 2010, our first cohort of students entered our Master's Program in Biotechnology. We have been introducing new courses for this program over the time period of this review. Three new courses were offered in 2010-2011: Biol 579 Principles and Practice of Biotechnology, Biol 580 Entrepreneurial Biotechnology, and Biol 589 Introduction to Nanobiotechnology. In 2011-2012, we continued to expand the curriculum for the Master's Programs in Biotechnology and in Clinical Laboratory Sciences with multiple new courses being developed and offered for the first time including: Biol 557 Molecular Biotechnology, Biol 581 Essentials of Biotechnology Project Management, Biol 582 Biotechnology Internship, Biol 583 Regulation of Domestic and Global Biotechnology Products, Biol 593 Rational Drug Design, Biol 596 Computational Genomics, Biol 747 Advanced Hematology, and Biol 751 Laboratory Management. The first cohort of students graduated with Master's in Biotechnology in Spring 2012 and enrollment in the program is growing.

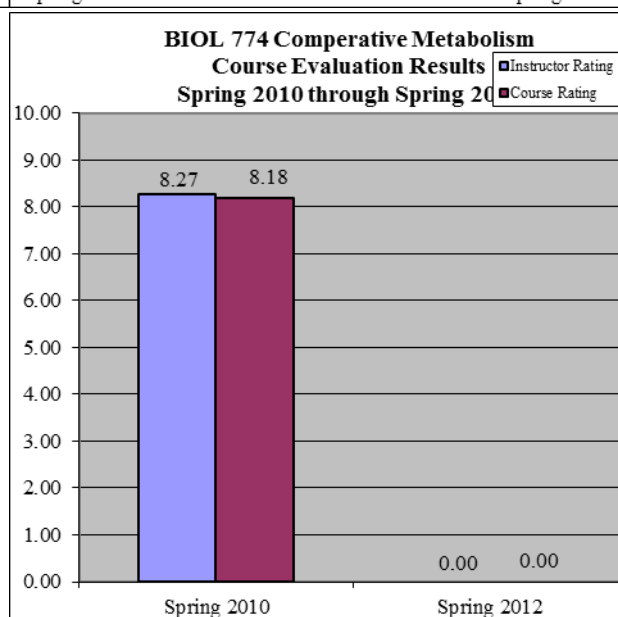
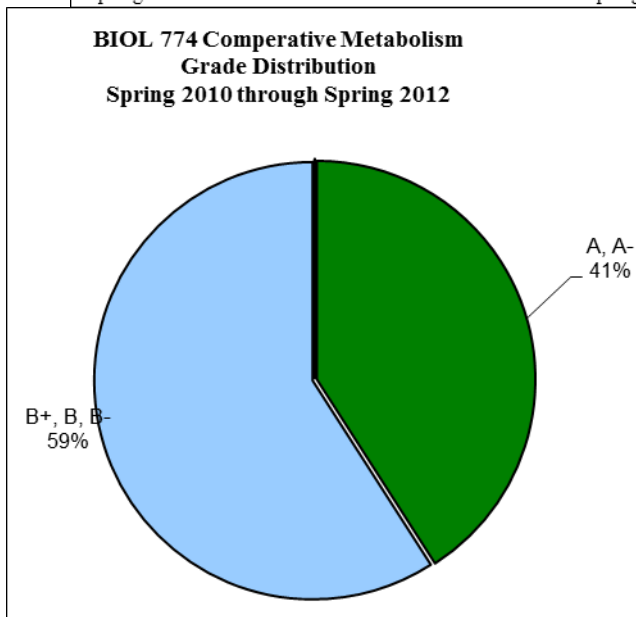
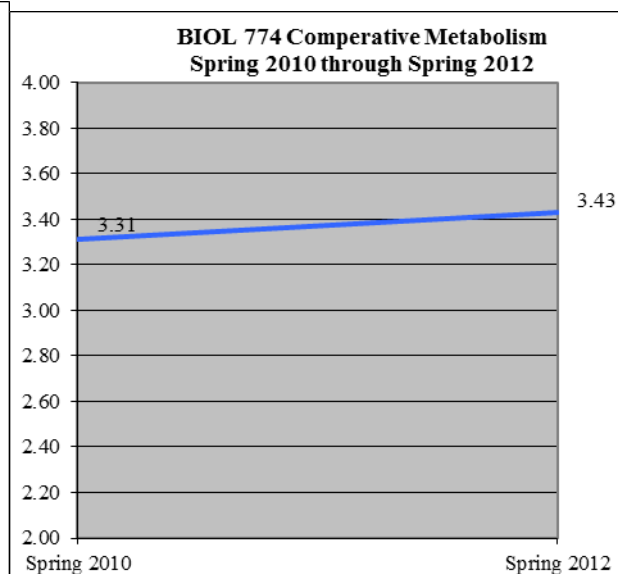
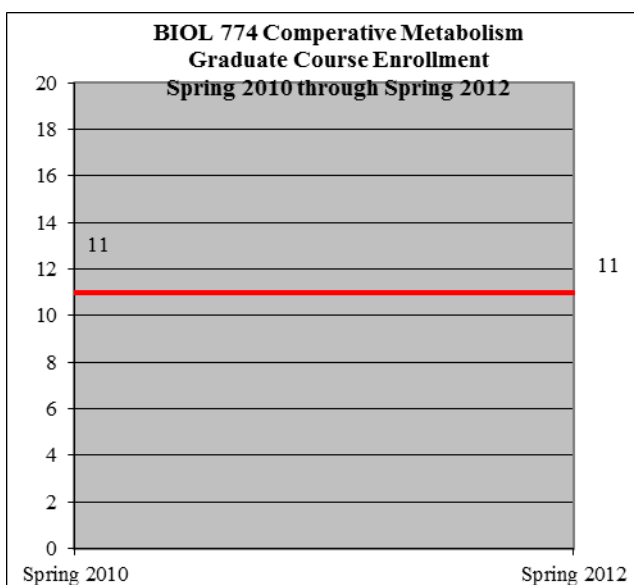
COURSE SUMMARY DATA: DEPARTMENT OF BIOLOGY
BIOL 727 Meth-Biological Research

Term	Graduate Course Enrollment	Course Grade		Course Grades							Course Eval.		Instructor Rating		Course Rating	
		Avg.	StDev.	Grade Distribution							#	%	Avg.	StDev.	Avg.	StDev.
				A, A-	B+, B, B-	C	F	W	I							
Fall 2008	9	3.37	0.28	3	6						0	0.00%				
Fall 2010	14	3.39	0.64	7	6	1					6	42.86%	9.17	0.98	9.50	0.84
Fall 2011	11	3.25	0.63	4	6	1					0	0.00%				
Fall 2012	9	3.19	0.44	2	7						0	0.00%				



**COURSE SUMMARY DATA: DEPARTMENT OF BIOLOGY
BIOL 774 Comperative Metabolism**

Term	Graduate Course Enrollment	Course Grades									Course Evaluation Results					
		Course Grade		Grade Distribution							Course Eval.		Instructor Rating		Course Rating	
		Avg.	StDev.	A, A-	B+, B, B-	C	F	W	I	#	%	Avg.	StDev.	Avg.	StDev.	
Spring 2010	11	3.31	0.48	4	7					11	100.00%	8.27	1.49	8.18	1.66	
Spring 2012	11	3.43	0.52	5	6					0	0.00%					



GRADUATE COMPREHENSIVE EXAMINATION RESULTS
SCHOOL OF ARTS AND SCIENCES
DEPARTMENT OF BIOLOGY
AY2008-2009 to AY2012-2013

Master's Comprehensive Exam

	Fail		Pass		High Pass		Pass w/Honors		TOTAL
	#	%	#	%	#	%	#	%	
AY2008-2009		0.00%		0.00%		0.00%		0.00%	0
AY2009-2010		0.00%		0.00%		0.00%		0.00%	0
AY2010-2011		0.00%	1	100.00%		0.00%		0.00%	1
AY2011-2012		0.00%	8	100.00%		0.00%		0.00%	8
AY2012-2013		0.00%	8	100.00%		0.00%		0.00%	8
TOTAL	0	0.00%	17	100.00%	0	0.00%	0	0.00%	17

Doctoral Comprehensive Exam

	Fail		Pass		High Pass		Pass w/Honors		TOTAL
	#	%	#	%	#	%	#	%	
AY2008-2009		0.00%	2	100.00%		0.00%		0.00%	2
AY2009-2010		0.00%	2	100.00%	0	0.00%		0.00%	2
AY2010-2011		0.00%	3	100.00%	0	0.00%		0.00%	3
AY2011-2012		0.00%	5	100.00%	0	0.00%		0.00%	5
AY2012-2013	0	0.00%	3	100.00%	0	0.00%		0.00%	3
TOTAL	0	0.00%	15	100.00%	0	0.00%	0	0.00%	15

Note:

- 1) Milestone outcomes were included in the categories High Pass and Pass with Honors if these designations were explicitly indicated in the students' milestone record.
- 2) Category "High Pass" includes both "High Pass" and "Pass with distinction".
- 3) The count in this table is based on the exam outcomes of all attempts in an academic year.
- 4) Level of the comps, i.e. Master's and doctoral, is based on the milestone activities; if there is no specification of the level in the record, students' degree level is used to determine the level.

GRADUATE PROGRESSION AND GRADUATION
SCHOOL OF ARTS AND SCIENCES
DEPARTMENT OF BIOLOGY
Graduate Cohort Fall 2008 through 2012
Master's Program

	Graduate Cohort Size	Returned To CUA in Fall 2009		Returned To CUA in Fall 2010		Returned To CUA in Fall 2011		Returned To CUA in Fall 2012		Returned To CUA in Fall 2013		Graduated in One Year		Graduated in Two Years*		Graduated in Three Years*		Graduated in Four Years*		Graduated in Five Years*	
		No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Fall 2008	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Fall 2009	1			1	100.0%	1	100.0%	1	100.0%	0	0.0%	0	0.0%	1	50.0%	1	50.0%	1	50.0%		
Fall 2010	10					9	90.0%			2	20.0%	1	10.0%	7	70.0%	8	80.0%				
Fall 2011	8									7	87.5%	1	12.5%	7	87.5%						
Fall 2012	10											8	80.0%	1	10.0%						

*Two to five years of graduation rates are cumulative.

Note: A particular cohort is defined as the combination of the students first enrolled in consecutive sessions of one year: the summer session or the fall semester. For example, cohort 2008 consists of students first enrolled in summer 2008 or fall 2008.

GRADUATE PROGRESSION AND GRADUATION
SCHOOL OF ARTS AND SCIENCES
DEPARTMENT OF BIOLOGY
Graduate Cohort Fall 2008 through 2012
Doctoral Program

	Graduate Cohort Size	Returned To CUA in Fall 2009		Returned To CUA in Fall 2010		Returned To CUA in Fall 2011		Returned To CUA in Fall 2012		Returned To CUA in Fall 2013		Graduated in One Year		Graduated in Two Years*		Graduated in Three Years*		Graduated in Four Years*		Graduated in Five Years*	
		No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Fall 2008	4	4	100.0%	4	100.0%	3	75.0%	3	75.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	50.0%
Fall 2009	2			1	50.0%	1	50.0%	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		
Fall 2010	3					3	100.0%			2	66.7%	2	66.7%	0	0.0%	0	0.0%				
Fall 2011	6									4	66.7%	4	66.7%	0	0.0%	0	0.0%				
Fall 2012	8											8	100.0%	0	0.0%						

*Two to five years of graduation rates are cumulative.

Note: A particular cohort is defined as the combination of the students first enrolled in consecutive sessions of one year: the summer session or the fall semester. For example, cohort 2008 consists of students first enrolled in summer 2008 or fall 2008.