

Assessment Findings and Curricular Improvements
Department of Biology
Master's and Ph.D. Programs

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

Required Courses Discussion (Attachments A and B):

The Department of Biology analyzed course grades, and enrollment data in Biol 727 (Methods in Biological Research) [Attachment A] and Biol 774 (Comparative Metabolism) [Attachment B] for a three-year period (Spring 2004 through Fall 2006). 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.

During the period of analysis, Biol 727 enrolled between four and five students in each of the three fall semesters. The grades for all of the students were in the good to exceptional performance (B- to A+) range, with average grades ranging from 3.28 to 3.48 per semester. In Biol 774 that is offered in alternate years, the course was taught twice during this period with an enrollment of 12 students in Spring 2004 with one of those students auditing the class, and 9 students in Fall 2006. Over the period analyzed, nearly 90% of the students were in the good to exceptional performance range (10 out of 11 graded students and 8 out of 9 students), with average grades ranging from 3.21 to 3.33 per semester. In each of the semesters, there was one student who received a C in Biol 774. The 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 the 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 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. In the future, we plan to modify the evaluation method for these courses so that official data can be gathered and reported.

Comprehensive Exams and Progression (Attachments C and D):

Since there are so few MS students, the data are not sufficient to derive meaningful assessments for the MS program. The low student numbers are because many of the MS students transition into the Ph. D. program without formally obtaining the MS degree. These students are required to fulfill specific requirements and apply for changing their candidacy from MS to Ph. D., which will be decided by faculty vote.

With respect to the Ph. D. program, 34 students entered during 2000-2007. The students typically took their comprehensive exams in the third or fourth year of study. Therefore, data from cohorts 2000-2004 were examined. Of the 20 students who entered the program during this time period, 17 passed their comprehensive exams by the end of fourth year. Of the other 3 students, 2 had left the program for personal reasons, and 1 received a Master's degree in Biology. Of the 17 students who passed the comprehensive exams, 11 graduated with their Ph.D. degrees and 6 of them are still working on their dissertations. Of these 6 students, 4 entered the program in 2004 and the other 2 in 2002. Of the latter 2 students, one student took a leave of absence for more than a year for personal reasons and rejoined later. The other student had to change the laboratory and start a new project due to the transfer of the dissertation advisor to another university.

Full-time students took 5-6 years to complete the Ph D whereas the part-time students took 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 for Master's Program and Ph.D. Program

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.

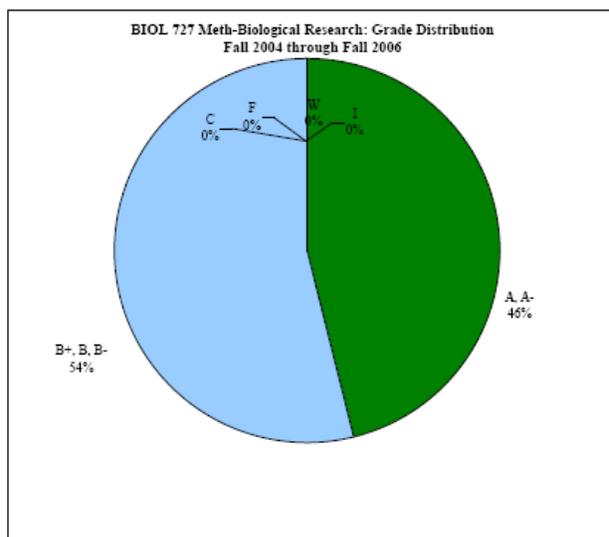
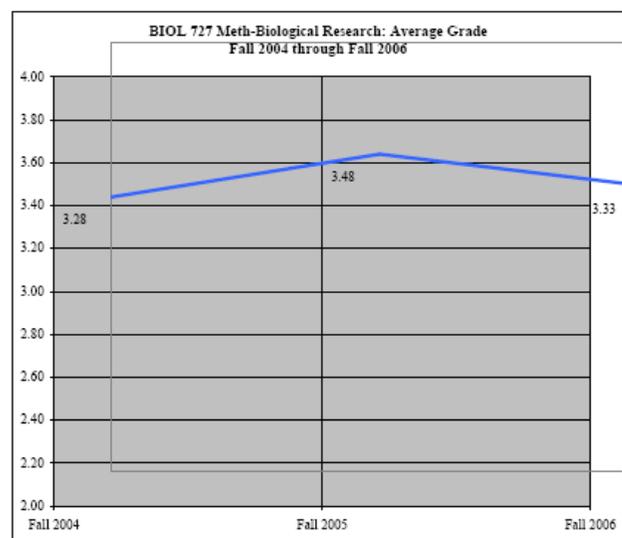
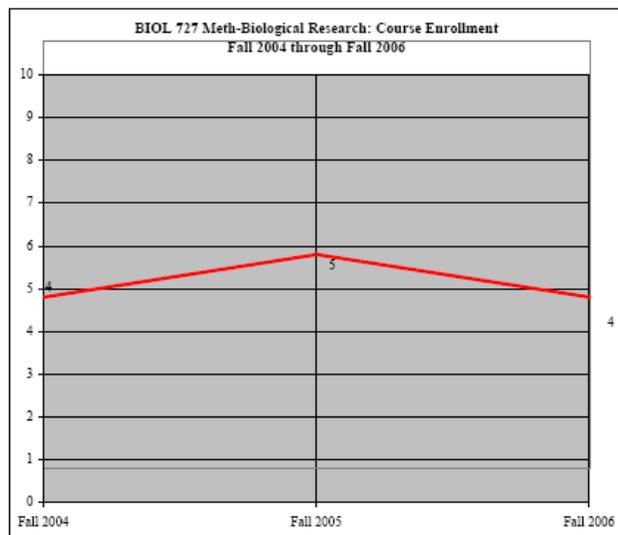
Because our department is small, our faculty members know our students well. Therefore, it is easy for us to collect anecdotal evidence regarding our curriculum from both our current students and alumni who visit the department frequently. One recent curricular improvement was made to Biol 725 Methods in Biological Research Laboratory. This laboratory course is the companion to the Methods in Biological Research lecture course (Biol 727). The Biol 725 course previously consisted of laboratory exercises taught by a single instructor. Since most of our students are already familiar with the basic laboratory techniques through their previous academic and research programs and because we saw the need to provide opportunities to explore the various laboratories in the department and to have one-on-one contact with all our faculty members at the outset of the program, we overhauled this course. Now, it consists of a series of two week rotations through the laboratories of all of our faculty members. This new course exposes the students to actual research scenarios and techniques and at the same time allowing students to get better acquainted with all the faculty members and make an informed choice of dissertation advisor.

In order to better track research progress and provide specific feedback, the department has incorporated a new requirement. The respective dissertation committees meet with the students beginning their third year in the program. The students formally report the progress made, and the committee makes appropriate recommendations for successful completion of dissertation research at high standards. Finally, in the future, we hope to develop a more formal survey mechanism for collecting data from alumni on their perception of how the curriculum relates to their employment in biology fields. Such data will help us to make further improvements to our Graduate Program.

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

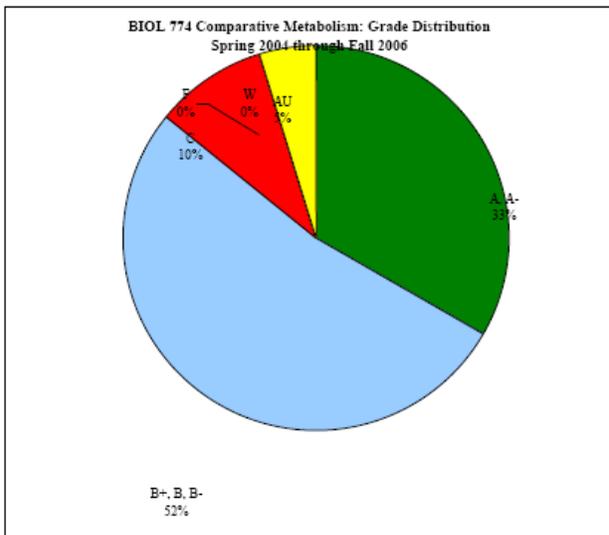
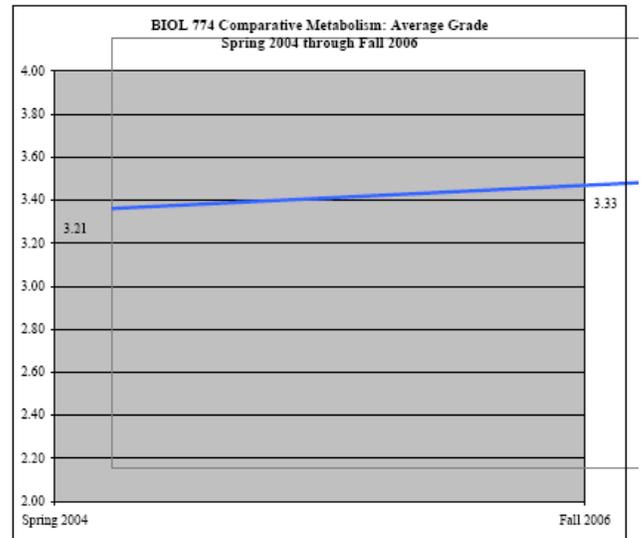
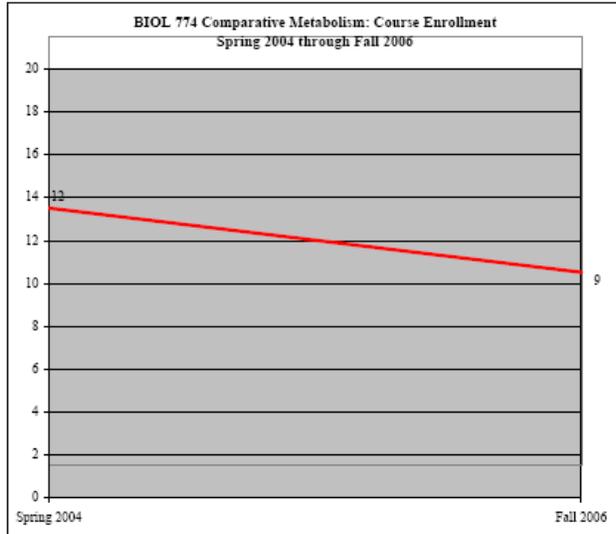
Term	Course Enrollment	Course Grade		Course Grades Grade Distribution						
		Avg.	StdDev.	A, A-	B+, B, B-	C	F	W	I	
Fall 2004	4	3.28	0.51		2					
Fall 2005	5	3.48	0.50	3	2					
Fall 2006	4	3.33	0.29	1	3					



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Institutional Assessment

COURSE SUMMARY DATA: DEPARTMENT OF BIOLOGY
BIOL 774 Comparative Metabolism

Term	Course Enrollment	Course Grade		Course Grades Grade Distribution						
		Avg.	StdDev.	A, A-	B+, B, B-	C	F	W	AU	
Spring 2004	12	3.21	0.54	3	7	1				1
Fall 2006	9	3.33	0.59	4	4	1				



Attachment C

Graduate Student Comps Exam Data Biology Department (Cohort 2000-2007)

Master's Program

Comps

Cohort	Cohort Size	Passed MS comps in 2000-01	Passed MS comps in 2001-02	Passed MS comps in 2002-03	Passed MS comps in 2003-04	Passed MS comps in 2004-05	Passed MS comps in 2005-06	Passed MS comps in 2006-07	Passed MS comps in 2007-08
2000	1	0	0	0	1	0	0	0	0
2001	2		0	1	0	0	0	0	0
2002	0			0	0	0	0	0	0
2003	2				0	0	0	0	0
2004	1					0	0	1	0
2005	1						0	0	1
2006	0							0	0
2007	0								

PhD Program

Comps

Cohort	Cohort Size	Pass PhD comps in 2000-01	Pass PhD comps in 2001-02	Pass PhD comps in 2002-03	Pass PhD comps in 2003-04	Pass PhD comps in 2004-05	Pass PhD comps in 2005-06	Pass PhD comps in 2006-07	Pass PhD comps in 2007-08
2000	1	0	0	1					
2001	7		0	0	3	4	0	0	0
2002	6			0	1	1	2	0	0
2003	3				0	1	2	0	0
2004	3					0	0	1	2
2005	3						1	1	1
2006	6							0	1
2007	6								

Note: A particular cohort is defined as the combination of the students first enrolled in consecutive sessions of one year: the summer session, the fall semester, or the spring semester the following year.
For example, Cohort 2000 consists of the students first enrolled in Summer 2000, Fall 2000, or Spring 2001.

Attachment D

Graduate Student Retention & Graduation Data Summary
Biology Department (Cohort 2000-2007)

Master's Program

Cohort	Number of entering master's students	Number of students who have not received a degree and did not maintain continuous enrollment	Number of students who passed comps	Graduated in 1st year	Graduated in 2nd year	Graduated in 3rd year	Graduated in 4th year	Graduated in 5th year	Graduated in 6th year	Graduated in 7th year	Graduated in 8th year
2000	1	0	1	0	0	0	1	0	0	0	0
2001	2	1	1	0	0	1	0	0	0	0	
2002	0	0	0	0	0	0	0	0	0		
2003	2	2	0	0	0	0	0	0			
2004	1	0	1	0	0	1	0				
2005	1	0	1	0	0	1					
2006	0	0	0	0	0						
2007	0										

PhD Program

Cohort	Number of entering doctoral students	Number of students who have not received a degree and did not maintain continuous enrollment	Number of students who passed comps	Graduated in less than 2 years	Graduated in 3rd year	Graduated in 4th year	Graduated in 5th year	Graduated in 6th year	Graduated in 7th year	Graduated in 8th year
2000	1	0	1	0	0	0	0	0	1	0
2001	7	0	7	0	0	0	2	3	1	
2002	6	2	4	0	0	0	0	2		
2003	3	1 (received MS)	2	0	1 (MS)	0	1			
2004	3	0	3	0	0	0				
2005	3	0	3	0	0					
2006	6	0	1	0						
2007	6									

Note: A particular cohort is defined as the combination of the students first enrolled in consecutive sessions of one year: the summer session, the fall semester, or the spring semester the following year. For example, Cohort 2000 consists of the students first enrolled in Summer 2000, Fall 2000, or Spring 2001.