

Product Name MasteringBiology

Course Names General Biology I and II

Credit Hours Four (each)

Key Results Adding prelecture MasteringBiology assignments facilitated increased student preparedness and engagement and enabled more time for interactive learning. As a result, final course grades of A and B significantly increased.

Text

Campbell Biology: Concepts and Connections, 7e, Jane B. Reece, Martha R. Taylor, Eric J. Simon, and Jean L. Dickey

About the Course

General Biology I and II is a two-course sequence that introduces students to the principles and concepts of biology. Upon completion of General Biology I, students should be able to demonstrate understanding of life at the molecular and cellular levels. Upon completion of General Biology II, students should be able to demonstrate comprehension of life at the organismal and ecological levels. The courses are offered both in a traditional, face-to-face, lecture-plus-lab format and fully online with students utilizing an at-home lab kit.

Course Redesign

Our school serves many nontraditional students. The goal of the course redesign was to address the issue of underprepared students and to provide a resource for remediation outside the classroom.

We implemented the Supplemental model developed by the National Center for Academic Transformation. This model retains the basic structure of the traditional course and supplements lectures and textbooks with technology-based, out-of-class activities, or changes what goes on in the classroom by creating an active learning environment within a large, lecture hall setting.

From our experience in this departmentwide redesign, we identified the following best practices:

- Involve faculty as part of the planning team.
- Communicate redesign goals and keep faculty communication channels open.

- Set a timeline and include benchmarks to ensure the process continues to move forward.
- Provide students with start-up guidance, information for technical support, and an explanation of the value of Mastering.
- Reinforce the value of doing assignments before lecture.

Implementation

Starting fall 2012, we implemented Mastering in Anatomy and Physiology I and II, General Biology I and II, General Chemistry I and II, and Microbiology. We added Mastering to Introductory Physics in spring 2013.

Instructors are required to assign prelecture homework, but have flexibility with regards to the assigned content. The majority of instructors give weekly Mastering assignments that include both tutorial and end-of-chapter questions.

Instructors report that the automated grading in Mastering makes it easier to assign graded homework and to understand where students need help. Beginning spring 2013, we added student learning outcomes to our Mastering homework to (1) facilitate a better understanding of student course and program performance and (2) inform decisions on course changes.

Assessments

50 percent	Lecture exams
15 percent	Final exam
15 percent	MasteringBiology homework
15 percent	Lab (participation, reports, practicals, exams)
5 percent	Other

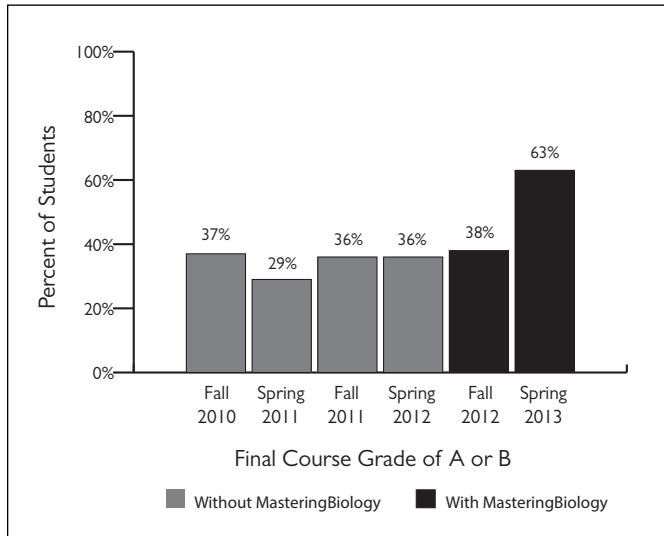


Figure I. General Biology II Final Course Grades of A or B with and without MasteringBiology, Fall 2010–Spring 2013 (Fall 2010 n=41, Spring 2011 n=49, Fall 2011 n=39, Fall 2012 n=25, Spring 2013 n=35)

Final Course Grade	Average MasteringBiology Homework Score	
	General Biology I	General Biology II
A	93%	100%
B	85%	95%
C	79%	91%
D	70%	78%
F	41%	58%

Table I. Correlation between Final Course Grade and Average MasteringBiology Homework Score, Fall 2012

Results and Data

A class test with MasteringBiology was conducted in a few sections in the spring 2012 semester. MasteringBiology was implemented in all sections beginning fall 2012. Our results show that for students who successfully complete General Biology I, there is a higher rate of As and Bs in General Biology II for the semesters using MasteringBiology.

- The percentage of students earning an A or B in General Biology II increased to 63 percent in spring 2013, the first semester in which students used MasteringBiology for both General Biology I and General Biology II (figure I).
- Students who received an A in General Biology I or II in fall 2012 scored an average of 93 percent and 100 percent respectively on their MasteringBiology homework (table I).
- Students who received an F in General Biology I or II in fall 2012 scored an average of 41 percent and 58 percent respectively on their MasteringBiology homework (table I).

The Student Experience

Students like the opportunity to walk through content prior to lecture, are more engaged in learning, and are more prepared for class. In addition, results from a fall 2012 survey of students in both General Biology I and II indicate the following:

- 78 percent recommended that Mastering be used in any course for which it is available.
- 77 percent believe that the use of MasteringBiology increased their understanding of the course content.

Student comments include:

- “The quizzes and assignments were just challenging enough for me to complete them and learn from them.”
- “I liked the videos. I learn better when I see how things work instead of just reading about it.”

Conclusion

We redesigned our science courses adding Mastering to provide students with a tool to help them prepare for class and get help when they need it the most. Prelecture homework assignments engage students in course content outside of class and better prepare them for lecture. This in turn enables us to increase the amount of interactive learning and critical thinking activities during class.

*Submitted by Louis McIntyre, Science Department Chair
Robeson Community College*