Abstract
A growing body of literature and cultural discourse expresses concern about student technology use in the classroom and whether technology is helping or hindering student learning. Many discussions of the impact of student technology use have been based on anecdotal reports, and most experimental investigations have focused on the effects of technology usage on learning from a single lecture. This project is a quasi experimental study of the effects of students’ use of laptops and other electronic devices on final course grades during the full term of an actual course. Students in two different lecture-based courses were allowed to use technology at will during class meetings over the course of an academic quarter. Student self-reports and wifi access logs tracked electronics usage. Students who accessed the Internet during lectures obtained significantly lower course grades, even when taking notes via computer, compared to students taking notes by hand. Students who only used computers to take notes during lectures obtained slightly lower course grades than non-technology-using students, but the difference was not significant.

Introduction
• For a number of years, interest in the potential costs and benefits of student laptop use during classes has been increasing. While many educators tout the benefits of integrating student technology use into course design, a growing number of instructors and institutions are limiting students’ use of laptops and other electronic devices during class meetings due to concerns about negative effects of technology use on classroom engagement and students’ processing of information. The actual impact of student technology use during lectures has only recently begun to receive serious empirical attention.
• A number of experimental studies have examined effects on learning of students’ use of laptop computers during a single lecture. Broaders and Smutko (2013) found that students who took paper-and- pen notes scored better on a quiz of lecture material than those who were using Facebook during the lecture. In addition, students performed better on the quiz when they had listened to a live lecture rather than a video recording of the exact same lecture. Sana, Weston, and Cepeda (2013) found that students multitasking on a computer during a lecture scored lower on a test of the material, and that students who were able to see the computer screen of a multitasking peer also scored lower. Mueller and Oppenheimer (2014) examined the effects of paper-and- pen notes versus computer notes on student comprehension of factual and conceptual information, finding that the computer note takers did significantly worse on the conceptual information than those taking notes by hand.

• In all of the aforementioned studies, the students were listening to a lecture and completing assessments on the material only as research participants. The scores they received on the quizzes did not affect their grades in actual courses that would appear on their transcripts.

• The current study builds on this body of research by assessing the impact of student technology use in a more realistic setting – one of their actual courses. Support for this project was provided by the Residential College Fellow Assistant Research Award Program, funded by the technology use in a more realistic setting – one of their actual courses.