

TRANSITIONING AN ENGINEERING COURSE TO STUDIO FORMAT

John McNeill¹, Kevin Keenaghan²

Abstract □ *The more laboratory-intensive studio format offers the possibility of improving student understanding by providing an interactive, hands-on treatment of the theory as it is taught during lectures. For faculty considering the change in format, one drawback is the significant time investment required in reconfiguring course delivery for the new format. This paper describes the transition to such a studio format, utilizing the results of a test lecture performed prior to the course to better prepare the format to meet the needs of both faculty and students.*

Index Terms □ *Studio format, course transition.*

INTRODUCTION

EE4902 (*Analog Integrated Circuit Design*) is a senior level Electrical Engineering course offered at Worcester Polytechnic Institute. Historically, the course has entailed five 50-minute lecture periods each week with a 3-hour lab in alternate weeks. Course evaluations have indicated that many students find the limited lab experience unsatisfying. Students, faculty, and industry recruiters have all complained of poor retention of course material by the students. These problems motivated the change in course format to improve the lab experience and increase retention.

THE TRANSITION

During the summer of 2001, a new studio classroom was fully renovated with equipment suitable for EE4902. Although students had already pre-registered for the course with the original 50-minute lecture periods, the change to the studio format was proposed for the spring 2002 semester with the intent of completing the lectures in four 50-minutes sessions per week, with three hours of open lab time for any work not completed during lecture. Although most courses delivered in studio format use longer lecture periods [1], shorter class periods held more frequently may also be acceptable and may help alleviate retention problems that occur when classes are too infrequent [2].

To judge the feasibility of studio format delivery in a 50-minute lecture period, a “test-drive” lecture was given in December 2001 for 13 students who responded to an e-mail appeal for volunteers. The students were given preparatory work, and then participated in a “typical” studio lecture planned to be 15 minutes of traditional lecture, 20 minutes of lab measurements, and 15 minutes of simulations. After the “test-drive” the students completed an evaluation form.

The session lasted 20 minutes longer than expected, which suggested the infeasibility of doing both lab and simulations in one day. For the actual course, 25-minute lecture segments were followed by lab exercises on some days and simulations on the rest. The “test-drive” showed the 50-minutes lecture period to be acceptable with this change and, from the student evaluations, stressed the importance of the three-hour open lab session for students requiring extra time.

In an attempt to test the effectiveness of the studio format during the actual course, one question on each of the course exams was geared specifically to information covered in the studio (lab and simulation) sections of the lectures. A total of 29 out of 43 students performed better on these “studio questions” than on the remaining traditional questions. Interestingly, of the six “test-drive” students who enrolled in the course, all performed better on the studio questions.

From the student evaluations administered at the end of the course, all but one student commenting on the new format mentioned a preference to the studio format. In response to a question regarding possible improvements, many students requested longer lecture periods. For the next offering of the course in the spring of 2003, two-hour lecture periods will be held three times a week, with both simulations and lab measurements in each period.

INITIAL CONCLUSIONS

The exam performance and student feedback relating to the new format are encouraging. For instructors planning a move to studio format, the logistics of the change are manageable. It is important to note that the “test-drive” can be an extremely effective tool to judge the reaction of students to the format and to better prepare for effective implementation of the change.

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¹ John McNeill, Worcester Polytechnic Institute, mcneill@ece.wpi.edu

² Kevin Keenaghan, Worcester Polytechnic Institute, kevink@ece.wpi.edu