McNeill and Keenaghan, "Transitioning an Engineering Course to Studio Format," FIE2002

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Course to Studio Format
Transitioning an Engineering
Conclusions

Assessment / Student Response

Course Modifications

“Test Drive”

Motivation

Presentation Overview
Course: EE4902 (Analog IC Design)

- Equipment suitable for EE4902
- Completed Summer 2001

New studio classroom:

- Poor retention of material
- Unsatisfying lab experience for students
- Complains

Complaints:

- Junior / Senior / Grad Level

Motivation

Experiment: “Test Drive!”

Is one-hour delivery of studio lecture possible?

• Usually longer lectures (2-3 hour), 2X / week

Most studio classes:

• Fixed at one hour, 4X / week

Lecture time:

Problem
Students complete evaluation form afterward.

- 15 minutes of computer simulations
- 20 minutes of lab measurements
- 15 minutes of lecture
- Explore feasibility of 50-minute lecture
- Test lecture with student volunteers

"Test Drive"
Volunteers solicited by e-mail

- No restrictions: some had taken EE4902 already

22 volunteers

- $20 gift certificate to a local restaurant

Bribe Incentive:

- 13 actually showed up for the test drive

Student Population
• Lecture lasted 20 minutes too long
  – Lab and Simulation in one Lecture too much?

• Lecture plus Simulation other days

• Lecture plus Lab measurements some days

• One hour Lecture, 4X / week

• Three hour open Lab, 1X / week

• Allow flexibility for students who need extra time

• Modify delivery for actual course:
  – Three hour open Lab, 1X / week
  – Lecture plus Simulation other days
  – Lecture plus Lab measurements some days

Test Drive Results
Most students preferred the new studio format

- “I learn by doing – so combining the theory with practice at the same time is great”
- “I think having a 2-hour class would allow more depth in topics”
- “Some of the time I felt rushed trying to keep up”
- “The simulation took twice as long as expected”

Many students commented on the quick pace

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Test Drive Student Feedback
Three exams given during the 7-week course

Hypotheses: Students would perform better on "studio questions" than on others.

Example: Waveforms measured from oscilloscope to "studio information"

On each exam, one question directly related.

Course Assessment
Result: 67% performed better on "studio" questions

Student Response (Course Evaluations)

**Positive: Studio format**
- “Cool to see what we learned in lecture applied immediately after to relate the theory to practice”

**Negative: Lecture period too short**
- “Not enough time for labs! Make class 2 hours”
- “Made it to my 11:00 about 6 times”
Exam results encouraging

- More assessment in next offering (Spring 2003)

Conclusions

- Studio format is well-received

- Test drive is an excellent tool

- Advancing information that improved delivery

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Conclusions
• Judith Miller, PhD, WPI

• Brad Lister, PhD, RPI