
Panel on Teaching

INFORMS Doctoral Colloquium
November 6, 1999
Philadelphia, PA

Jennifer K. Ryan

*Assistant Professor
School of Industrial Engineering
Purdue University*

Before The First Year

- Get some teaching experience.
- Negotiate assignments before you arrive.
 - ◆ Get a teaching load reduction.
 - ◆ Find a course that will be yours.
 - Get and stay organized.
 - Get lecture notes from someone.
 - ◆ Teach a graduate level course.
 - Advertise and recruit students.
 - ◆ Get start-up funding for a graduate student.

The First Year: Teaching Tips

- ◆ You'll probably spend too much time on teaching.
- ◆ May need to make it clear that you are a faculty member.
 - not a grad student, not an adjunct
- ◆ Remember that to the students you are an unknown - you must earn their respect.
- ◆ Don't expect all students to like you.
- ◆ There's more bureaucracy than you expect.
- ◆ Attend teaching workshops for new faculty.

Teaching in an Engineering Environment

- Three basic types of courses:
 - ◆ Undergraduate
 - required vs. elective
 - ◆ Masters
 - ◆ PhD
- Teaching on TV
- Other teaching related tasks
- Teaching vs. Research

Undergraduate Courses Benefits

- Material doesn't change much from year to year.
- Very easy to plan, the curriculum is set.
- Few questions you can't answer.
- Teaching seniors can be fun (teaching sophomores is not).
 - ◆ You may actually learn stuff from your undergraduate students!

Undergraduate Courses Difficulties

- Large classes.
 - Crowd control can be a problem.
 - Students can be very demanding.
 - Time consuming.
- Gaining respect can be difficult.
- Many students are not motivated to learn.
- Wide range of abilities.
- Curriculum is set.

Undergraduate Courses Tips

- Teach the same class multiple times.
- Learn names (at least try).
- Put every policy in writing in the syllabus from the first day.
 - Allow no exceptions!
- Be honest from the start and provide regular feedback.
- Mid-semester teaching evaluations.

Undergraduate Courses Tips

- Set limits.
 - If you are overwhelmed by students: HIDE.
- Create a class webpage.
- Change HWs and exams every semester.
- Work to prevent academic dishonesty.
- Use lots of current examples.
 - Demonstrate the relevance of the lecture.

Undergraduate Courses Tips

- Working with TAs
 - ◆ Learn how to use them.
 - ◆ Make them come to class.
 - ◆ Try to choose your own.
 - ◆ Teach them how to be better TAs.
 - ◆ Use them as a source of information:
 - Which subjects and problems students are having the most difficulty with.
 - Feedback on lectures.

Masters Level Courses Benefits

- Smaller classes.
- Students who want to be there.
- Higher teaching evaluations.
- Some flexibility in topics to be covered.
- Students from a variety of disciplines and backgrounds with interesting perspectives.
- Less lecture, more discussion.

Masters Level Courses Difficulties

- Finding the right balance between theory and practice.
 - Classes often include both MS and PhD students.
 - Some MS students want all practice.
- Wide range of goals and abilities.
- Some questions you can't answer.
- May not have a TA.

Masters Level Courses Tips

- Update material regularly.
 - Must be relevant.
- Invite industry speakers.
- Use case studies.
 - Good way to balance theory and practice.
 - Projects where there are no right answers.
- Force students to write and present.
 - Most engineering students need the practice!

Teaching PhD Level Courses

- Benefits

- ◆ Very small class sizes.
- ◆ It is your research.
- ◆ Can cover any topics you like.
- ◆ Students can give the lectures.
- ◆ Can be used to train your PhD students.
- ◆ You will learn a lot too!

Teaching PhD Level Courses

- Difficulties

- ◆ Time consuming (at least the first time).
- ◆ May need to write your own lecture notes.
- ◆ Many questions you can't answer.
- ◆ Teaching students to read and understand research papers can be difficult.

Other Teaching-Related Tasks

- Advising undergraduates and non-thesis masters students.
- Advising student organizations.
- Advising undergraduate research and design projects.
- Independent study with graduate students.
- Research with graduate students.

Finding Graduate Students

- Get exposure!
 - ◆ Teach a graduate course in your research area as soon as possible.
 - ◆ Schedule a talk during your first semester.
 - ◆ Take time to talk with students.
 - ◆ Review applications of incoming students.
 - ◆ Get funding.

Working with Graduate Students

- Teach/show them how to do research.
 - ◆ How to find research topics.
 - ◆ How to ask questions.
 - ◆ How to address ill-structured and open ended problems.
 - ◆ How to write papers and give presentations.
- Do not fund students in the first semester.

Balancing Research and Teaching

- Both are important.
 - ◆ Find out what is expected of you.
- Minimize the time required to be a good teacher.
 - ◆ Teach the same course several times.
 - Teaching evaluations will improve.
 - ◆ Be organized.
 - ◆ Use your TAs.