What I Wish They Had Told Me

When I Was In New Faculty Orientation

About Teaching at WPI

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Worcester Polytechnic Institute

ECE Department

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Presentation Overview

• Background

• Lectures ("Traditional" Teaching)

• Project Advising
  – Grading
  – Balancing Challenge and Support

• Academic Advising

• Summary
Personal Background

- 1979-1983  A.B. Engineering Sciences Dartmouth College (Graduated in top 45% of class)
- 1990-1994  Graduate School (Univ. Rochester, Boston U.)
- 1994-1999  Asst. Professor, WPI

Unable to hold a job more than 5 years
Teaching: Set High Expectations

• Find a teaching mentor: WPI students expect a lot from us!
• Treat students with respect
• Lectures: Be prepared, organized
  – Shows you respect students
  – Shows you’re working hard, which gives you credibility to:
• Demand a lot of work of your students
• Have high expectations, AND
• Communicate expectations clearly!
  – Work, honesty, critical thinking
• Provide support to help students succeed
• Let them cry on your shoulder if they don't. Failure is OK.
  – (But don’t change a grade unless you made a mistake!)

Try to remember what it was like when you were a student (maybe...)
High Expectations in EE2011/2022

• Extensive homework sets
  – calculation (“traditional” problems)
  – computation with software tools
  – written expression (e.g. meaning of basic concepts)
• Weekly labs
  – preparatory assignments
  – written lab reports
• Independent learning of software tools
• Small team projects with written and oral reports
• Challenging tests
  – require critical thinking
  – beyond "what was covered in class"

Support Services

- Instructor office hours
- Teaching Assistants (graduate students)
- Senior tutors (undergraduates)
- E-mail
- Web site
- Peer study groups
Student Evaluation Results

• Written comments
  – What did you particularly like about this course/lab?
  – What did you particularly dislike about this course/lab?
  – What strategy would you advise a friend to use to benefit from this course?

• Quantitative evaluations
  – The material to be learned in this course was difficult
  – The instructor:
    • assigned homework that aided my learning
    • challenged me to extend my capabilities
    • stimulated my interest in the subject matter
  – I learned a lot in this course
What did you particularly dislike about this course/lab?

- "Lots of work."
- "A lot of hard work - this isn't bad, but it's true. It's good that the course is hard - doesn't mean I have to like that fact."
- "Huge homework assignments."
- "The homeworks were lengthy, but with a head start they were not impossible."
- "Nothing, except the large homework assignments (guess it comes with the turf)."
- "Would have liked to do a few more labs - it is very helpful and rewarding to see things light up and work after theory is done."
- "Probably the only thing is the tests were a little difficult."
# Quantitative Evaluations

<table>
<thead>
<tr>
<th>Statement</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>The material to be learned in this course was difficult</td>
<td>1</td>
<td>17</td>
<td>56</td>
<td>26</td>
</tr>
<tr>
<td>The instructor assigned homework that aided my learning</td>
<td>0</td>
<td>0</td>
<td>35</td>
<td>65</td>
</tr>
<tr>
<td>The instructor challenged me to extend my capabilities</td>
<td>0</td>
<td>1</td>
<td>26</td>
<td>73</td>
</tr>
<tr>
<td>The instructor stimulated my interest in the subject matter</td>
<td>0</td>
<td>2</td>
<td>34</td>
<td>64</td>
</tr>
<tr>
<td>I learned a lot in this course</td>
<td>0</td>
<td>2</td>
<td>43</td>
<td>55</td>
</tr>
</tbody>
</table>

- 91 responses of a possible 120 (76%)
- Report percentages that
  Strongly disagree (SD), Disagree, Agree, Strongly Agree (SA)
Projects

- MQPs are just like projects you’ve done before
  - e.g. Ph.D. research, job experience

- MQPs are completely unlike any projects you’ve done before
  - Intent is to teach design (not necessarily get a result)
  - Also teamwork, communication, “process” aspects

Get a project advising mentor

- Find someone in your department who has advised award-winning MQPs
- Co-advise a project with them
Project Grading

• Never give an A the first term!
• No Fear: Give different grades to team members if warranted
• 1 paragraph e-mail to each student explaining grade, path to improvement next term
• Make it as much like a course as possible
  – Hand out criteria, procedures at first meeting
• Week-to-Week (Nicoletti)
  – At the end of each weekly meeting, identify 15 hours of work for each team member
  – At beginning of meeting, compare work done to last weeks goal; assign grade
  – No surprises at end of term
• End of Project (Vaz)
  – Confidential form on process issues, relative contribution level of partners
Sponsored Projects

Better Project Quality

• "Real World" project credibility
• Better project definition
  – Expect more from first term!
• "Customer" = easier to motivate students
  – Professor not the bad guy
• Compete with sponsor's competitors
  – Students live with real cost / budget constraint

http://ece.wpi.edu/~mcneill/papers/sponsoredprojects.pdf
Finding Contacts

Quantity Rules

• To get 1 good idea, you need 10 bad ideas

• To make 1 sale, you need to live through 10 rejections

• To get 1 project sponsored ...

• If a potential contact isn’t producing, spend time elsewhere!

http://ece.wpi.edu/~mcneill/papers/startcenter.pdf
Balance Challenge / Support

• 1st week: Minor hint
• 2nd week: Major hint (make it obvious)
• 3rd week: Tell them what to do

Important to tell sponsors MQP is primarily an educational experience to teach design

• NOT to "get something done"
  – Pay big $$$ for research to get deliverables: tell sullen grad student what to do
• Hard to let them flail when sponsor expects deliverables!
Academic Advising

Thank you, Alexander Graham Bell:
• X5381 is Ann Garvin’s office. She loves your phone calls.
• X5211 is the Registrar’s office. They love your phone calls.
• Find an advising mentor. Call / talk to mentor often.

• Be there (Academic Advising Day, appointments, etc.)
• Read the catalog!
• Talk with seniors in your department
  – What worked, what didn’t in their program of study
• Remember how clueless you were at age 18
  – Care about these people!
• Forget about what you were like when you were 18
  – Not everyone wants to be a professor!

“Someone at WPI cared about me as a human being”
What I've Learned

• Find mentors
  – Teaching
  – Project advising
  – Academic advising

• Expect Success
  – Set high expectations
  – Communicate expectations clearly

• Show by your performance that you care
  – About students
  – About what you’re doing