Growing as a Research Professional

Teaching and Course Design

Faculty Orientation

University of Tennessee

Adapted from Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty (2nd Edition)
Topics to be discussed:

- Why Teaching Well Matters
- Reasons to Teach
- Becoming an Effective Teacher
- Planning to Teach a Course
- Principles of Active Learning
- Assessing Student Learning
- Teaching Others to Teach
- Professional Considerations
Teaching and Course Design
“Well, here we go again. … Did anyone here not eat his or her homework on the way to school?”

“Mr. Osborne, may I be excused? My brain is full.”
Importance of Teaching Well

• Gaining the varied skills required to be a good teacher will:
  – Strengthen your résumé
  – Enhance your communication skills
  – Bring new energy to your research
  – Contribute to the greater good by educating the next generation of students
Importance of Teaching Well

• Important reasons to teach:
  – A strong teaching record can help your tenure case
  – Get to know potential students for your lab
  – Increase science literacy
  – Science needs to retain the best and brightest students
  – Science needs to draw diverse participants
  – Intellectual growth and job satisfaction
Becoming an Effective Teacher

• Before setting foot in the classroom:
  – Assess your strengths and weaknesses
  – Take advantage of professional help
    • Take advantage of whatever professional help the university or your department offers
    • Some professional societies also educate faculty
  – Observe and be observed
    • Ask a peer for feedback
    • Observe an experienced senior colleague
    • Enlist an outside observer
    • Seek feedback through formal peer reviews and students
Course Planning

- Course Planning: first establish the goals of the course being taught
  - The goals will impact every facet of the course, from the outline, how to involve TA's, and student assessment
  - Determining how to accomplish these goals
  - Decide on how to assess student learning at the start of the planning process
  - Incorporate the principles of Active Learning while planning the course
Active Learning (originated by educator John Dewey): 

*active learning uses a variety of problem-solving techniques to help students become active participants in the learning process, giving them a chance to clarify, question, apply, and consolidate knowledge*

Principles of Active Learning

- Cooperative learning
- Inquiry-based learning
- Assessment
Active Learning

• Implementing Active learning in the classroom (can be implemented in small and large settings)

• Pointers for implementing Active Learning
  – Do not try to cover too many topics
  – Provide an appealing context for the concepts you highlight
  – Start gradually and then add more
  – Encourage student questions
  – Use a variety of in-class exercises
  – Use real word examples and technology
  – Create an appropriate physical environment
Active Learning in the Lab

• College lab an ideal place for active learning

• Pointers for Active Learning in the Lab
  – Avoid “cookbook” experiments
  – Design or adapt existing inquiry-based experiments
  – Focus experiments on either teacher or student generated questions
  – Start a journal club
  – Incorporate films that stimulate thinking about a range of science issues
Assessing Student Learning

- Assessment a key component of teaching; to evaluate students and teaching strategies

- Developing exam questions
  - Take time to develop challenging questions
  - When possible, involve TA’s in writing and reviewing

- Question types – strengths and weaknesses
  - True/false
  - Short-answer
  - Multiple-choice
  - Essay
  - Other (e.g., group exams)
Course Design

• Designing a course is a complex and time-consuming undertaking

• Improving an existing course
  – Clarify your department’s expectations for the course
  – Ask for, review, and evaluate all materials from the faculty member who previously taught the course
  – When possible, review student exams and course evaluations
  – If possible, ask the faculty member who is turning the course over to you to describe her impressions of what worked and what did not
  – If possible, observe this person teaching the class
  – Determine what changes to make
Course Design

• Creating a new course more difficult and time-consuming than revising an existing one

• Three critical decisions
  – What to teach?
  – How to teach?
  – How to ensure that students are learning?

• What to teach?
  – Determine how the course relates to other courses in the department curriculum
    • Will the course be a prerequisite for higher-level courses?
    • Is it an advanced course?
    • Are major departmental changes under way that may affect the course?
Course Design

• What to teach?
  – Establish course content goals; identify three to five general goals
  – Identify a major course theme to lend continuity and provide perspective
  – Identify core concepts within the major theme
  – Define the objectives of individual units or lessons

• How to teach?
  – Determine the general structure of the course
  – Select resources
  – Will there be a website for the course?
  – Determine how student learning will be assessed
  – Divide the course into manageable pieces
Course Design

• How to teach?
  – Check the university calendar for scheduling
  – Prepare your syllabus -
    • Name of class, place, time, semester and year
    • Number of credit hours
    • Name and contact information for all instructors
    • Course Web site (if applicable)
    • Brief course description and statement of overall goals
    • Brief statement of objectives
    • Description of course format
    • A statement of assessment techniques
    • A schedule of class dates and topics
    • A schedule for assignment due dates
    • Information about the university’s academic policies and procedures
Teaching Others to Teach

• Teaching Assistants – reinforce the value of teaching effectively and involve them in course development
  – Schedule weekly meetings with TAs
  – Encourage TAs to seek professional training
  – Foster an openness to new techniques and active learning
  – Provide TAs with the necessary resources
  – Support TAs classroom efforts
  – Provide or suggest opportunities to teach
Professional Considerations

- **Scholar / Teacher: a challenging balance**

- **Time management:**
  - Teach the same course several times
  - Borrow or adapt high-quality curricula
  - Consider your personal rhythms and research schedule
  - Set realistic limits on class preparation
  - Make maximum use of TA’s without overburdening them

- **Teaching portfolio: teaching successes are considered as part of your tenure review**

- **Research and teaching careers can work hand-in-hand**
UTK-Tennessee Teaching & Learning Center

The purpose of the Tennessee Teaching and Learning Center is to facilitate the continuous improvement and learning at the University of Tennessee.

The learning center offers services to individual faculty members such as programs, customized workshops and individual, confidential consultations to improve their teaching ability and their student’s learning.

Visit http://tenntlc.utk.edu/default.html to learn more about the Tennessee Teaching & Learning Center.