

Revised Class Schedule

Date	Topic
8/31	Scientific Literature
9/7	Scientific Publishing
9/14	Written Communication
9/21	Oral Communication
9/28	Getting Funded: Introduction to Grant Writing
10/5	Ethics in Research
10/12	No Seminar – Fall Break
10/19	Receiving and Providing Mentoring
10/25	Teaching Goals and Assessments
11/2	Effective Lecturing
11/9	Academic and Non-Academic Jobs
11/15	No Seminar – Jeff on NSF Review Panel
11/23	No Seminar – Thanksgiving
11/29	Time-Management and Work-Life
12/6	<i>Buffer in schedule</i>

Effective Lecturing and Active Learning

*Information and figures derived from Workshop Materials
prepared by Prof. Gina Frey, WU Teaching Center*

Teaching Strategies

- General categories
 - Lecture
 - Discussion
 - Group work, cooperative learning
 - Active learning, guided inquiry
 - Problem-based learning, case studies
- Education research tells us that no one method is superior
- Effective teachers use a ***combination*** of teaching strategies

What Students Take in From Lectures

- What percent of the time do people listen?
 - **25-50%**
- In a lecture, students are asked to take in information immediately
 - Short-term memory holds **5-7 points**
 - What percent do people remember of what they hear, and of what they see?
 - **10% of what they hear**
 - **50% of what they see**
- Effective lectures help students listen effectively and remember the material

The Cone of Learning



Reference: *Engineering Education: Preparing for the Next Decade.*
Study by Arizona State University, December 1991.

Organizing Lectures

- Design lectures to meet your course goals, organizing the content along a theme or storyline
- For each class session
 - Have a learning objective: What do you want the students to take away from today's lecture?
 - Provide a structure to each class: Introduction, body, conclusion or summary
 - Provide an outline at the beginning
 - Build in questions or activities

Introduction

- Try to have three parts to an introduction
 - Describe how the current lectures fits into the overall course objectives
 - Review and transition from material covered in the previous class period
 - Have an attention-grabber for the new material to be presented in this session
- Throughout the semester, briefly retell the course story and point out where you currently are in the storyline

Body

- This is where you present and explain new material
- Instead of just plowing through all of the content, break it up into a series of mini-lectures
 - Each should focus on one major point
 - Each should last 10-15 minutes
 - Try to insert an activity (lasting 2-15 minutes) between each mini-lecture

Conclusion/Summary

- Recap the material presented
 - 2-5 minutes
 - Try to involve the students
- Close with a statement about the topic being presented at the next class period
 - Give the students a transition so they know what to expect and how everything is integrated

Preparing for Lectures

- Plan and prepare your lecture materials well in advance
 - First-time lecture preparation take between 2 and 8 hours per lecture
 - Incorporate different types of activities
 - Prepare notes for yourself
- Day before lecture: Go through the lecture once to review the material and check the length
- Dedicate at least 30-60 minutes before the lecture to prepare for class
 - Jeff blocks out 60-90 minutes, except for an 8:30 am class!

During and After the Lecture

- Interact with your students, including informally before starting
- Show enthusiasm for the subject and teaching in general
- Focus on clearly communicating to your students: Develop good presentation skills
- When asking questions, wait for students to answer
- Show respect for student ideas and questions
- After lecture, evaluate how it went and identify areas to fix for next time

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Active Learning

- Active learning yields greater retention and is more similar to what scientists actually do
- What are some ways to incorporate active learning into courses?
- What are some of the challenges with adding in active learning activities in courses?
- What active learning activities can be built into lectures?