

## 1 Philosophy

There are three foundational values which guide my teaching. The first is a profound belief in the value of an individual. Whether or not they realize it or act like it, my students are human beings who have dignity, value, potential, and much to give. A second belief is in the fundamental interconnectedness of all things. One area of knowledge will inform another and growth in any area of life will impact the whole. As a teacher it is my privilege to play a part in the process of my students' growth, and a joy to help them reach their own learning and career goals. The third belief is that with any gift comes responsibility, which applies to my own gifts as a teacher and to my students' gifts as students.

## 2 Objectives

There are four objectives that focus my efforts in teaching. I desire:

**to train my students in the skills and knowledge of the subject matter.**

**to teach my students to see the beauty that is in computer science.** The ability to appreciate the beauty of the computer science is important because—though surprising to many outside of this field—Computer Science has an intensely creative aspect. A proof, a program, or an algorithm requires not only knowledge, but emotional energy as well. Students who see their work as art consistently produce programs that are more elegant, more reliable, and more rewarding to themselves.

**to encourage students to notice and ask about the wider applications of the material.** This observation and inquiry about the wider implications of the material is essential to learning. Facts can become knowledge only when the students understand the connections between them. Once the students have learned to ask questions themselves, they become active participants in the learning process, and become their own teachers.

**to influence my students to develop a sense of personal and professional responsibility.** Most college-aged students are transitioning from adolescence to adulthood, from dependence to independence and interdependence. A key component of this transformation is the development of a strong sense of responsibility. The effects are most visible in emotional and relational contexts, and since teaching is a relational activity, this growth has a strong effect on both the outcome of the teaching and on the students as individuals.

## 3 Methods

**Communicating Objectives.** I always give a list of objectives at the beginning of a lecture and for each assignment, stated from the point of view of the student.

Clearly stated objectives will

**structure the content of the course material.** This enables the student to easily determine which statements should be recalled and understood, and which are given only as examples or explanation. To students seeing material for the first time, these may be difficult to distinguish.

**enable the students to measure their own progress.** Objectives communicate the expectations of the instructor, and show the students where to focus their efforts while learning, helping them achieve greater efficiency. By reviewing the objectives after a lecture or assignment, they will know what material they have mastered and what needs further attention.

**communicates respect to the students** When we give a lecture we ask for an hour of the students' lives. By stating our objectives we tell them what we will give them in return. This helps the students to feel that the time is well spent, and that the assignments are more than just "busy work".

**ensure that all aspects of the course work together.** Each component of the course will fit in with the others, helping to reinforce concepts by demonstrating them in multiple contexts, and the exams will be an accurate measure of learning.

**Grades** Grades must reflect mastery of material. Even for a student who values learning for its own sake, the course grade is very important. It is a reward for hard work, and a key to advancement in the future. It is also a measure of how well the student met the expectations of the instructor.

In order to give grades meaning, I assign a description to the letters. For example, an 'A' level of mastery indicates that a student is able to generate the correct answer. A 'C' level of mastery indicates that a student is able to recognize a correct answer.

I also assign cutoffs at the beginning of the semester, and design my exams so that a student with a 'C' level of mastery will be able to gain enough points for a 'C', and that a student with an 'A' level of mastery will be able to gain enough points for an 'A'. This solves two chronic grading problems: grade inflation (a symptom of grades that are meaningless) and lack of feedback (a student is unable to judge how well or poorly he/she is doing until it is too late to change the outcome of the grade).

**Acknowledge both Theory and Application.** A theory that is not applied is quickly forgotten, and application without theory lacks depth. Motivating examples and assignments where key concepts are implemented are two of the ways that I emphasize application. Referring to recent research, explaining links between the current topic and higher level material, and discussing the historical development of the ideas are some of the ways I emphasize the theory.

**Teach Students How to Learn.** In order for students to truly master material, they need to learn how to teach themselves. These skills are usually acquired toward the end of an undergraduate career. Methods I use to teach this are:

- to give "demonstration lectures" where I solve the homework set or write a small interpreter. I try to model the skills needed to complete the task, and think out loud to expose the reasoning process.

- I often answer a student's question by saying, "Let's try an experiment!" and make an example on the spot, or I ask the student, "What have you tried?" My hope is that the students will think, "I could have done that" and will have a strategy with which to approach future questions.
- to use active learning techniques during lecture by encouraging questioning during the lecture (even with more than 200 students) and solving sample problems during class toward the end of lecture.

**Emphasize the Students' Responsibility** Teaching the students how to teach themselves corresponds with them gaining the understanding that they are the ones most responsible for their education and its outcome. One area in which I emphasize this is in the mechanics of the course such as homework/extension policies and newsgroup question policies. Students are expected to take responsibility for mistakes and to be proactive in addressing them. Regarding newsgroup questions, students are encouraged to find the answer themselves and to report what they have tried. During lecture, I discuss how the concepts they are learning affect software engineering, and try to show the different consequences their engineering choices will have in light of the material they have learned.

It is frequently observed that people will meet the expectations you have for them, whether high or low. By communicating high expectations and support for my students, I hope to communicate respect and value for them as both students and as human beings.