Teaching Philosophy
Computer Science and Engineering

I believe that the purpose of an engineering education is to help students develop the skills that will be necessary for them to have during their future jobs. As most of these are practical skills, it is important that students receive ample opportunities to use them. In my courses, students will receive smaller exercises for practicing the new skills before they are required to use them on the larger projects that will make up the majority of their grade. Classes will emphasize driving examples to demonstrate the need for the new skills and how they may be useful and will incorporate both typical lectures as well as practical exercises or worksheets to give them a chance to utilize their newfound skills.

While knowing how to do things is important, it is also important to know when to do things. Engineering is the art of balancing a series of tradeoffs and so it is important that the students are able to understand the theory behind the skills well enough to elaborate on why they should use a particular method and why it is better than an alternative. To assess their design ability, students will be required to turn in short reports with their projects detailing their major design decisions and their rational for those decisions. Additionally, exams will focus on theory and design tradeoffs. They will be graded on whether they can make good design decisions, such as being able to tell when to use a linked list and when to use an array list, rather than on the minutia of the syntax, which their compiler would be easily able to fix for them in a real life situation.

Equally important to being able to do things is knowing what one can and cannot do. Students will give short summaries after class and be asked to identify the things that they have difficulty understanding. This has two purposes. First, it helps them meta-cognitively identify the areas in which they are having difficulty. Second, it allows me to assess how well the students are learning what is being taught. This will enable me to identify areas that the students do not understand, verify that the lessons I am trying to teach are the ones that they walk away with, and identify students who may be in need of some assistance. Identifying these students early and addressing the areas that are causing them the most difficulty will also help with finding alternate methods for helping them learn.

Earlier classes will focus on helping students develop the skills that they need and getting them the experience and confidence to be able to use them. Earlier exercises will be narrower to help guide them into making the right decisions. As they become more experienced, focus can be shifted onto design and critical thinking. Later exercises can be more open to allow them more opportunities for making useful design decisions.

By doing, students are able to learn. I believe in giving them sufficient chances to practice the skills we teach them. This allows them the opportunity to properly learn how to solve problems, become confident that they can actually do it, and the time to relearn topics if they did not get it right the first time. Practice makes permanent.