Teaching Statement  Leo Selavo

I have been teaching for more than ten years both as an instructor and a tutor, in three languages, in various countries and cultural settings, and about various computer science subjects. This variety of experiences has been a good test and a teacher to myself, and has convinced me that teaching is something I enjoy and am capable of doing.

As the most important goals of education process I see the transfer of knowledge, the capability of analyzing and applying it, and creating potential ability for students to add new values to the subject taught. As the means of teaching I cherish activities that immerse students in the subject and promote their active participation in the learning process. Give students the tools, give them a problem to solve, and guide them towards the solution in such a way that in the end they feel as if they have solved the problem by themselves. Thus the students have active participation, hands-on experience and acquire confidence in their capabilities in the new field.

I started teaching in 1993 at the University of Latvia, where I was asked to deliver the “Human Computer Interface” course and the ”Data Visualization” seminar for undergraduate students. I was solely responsible for the syllabus, lectures, assignments, and grading. In the mean time, my growing interest in hardware aspects of computer science led to another teaching appointment for the “Computer Organization” course until the spring 1996. Again, the course was fully my responsibility.

At the University of Latvia, I developed a teaching approach that stimulated students to collaborate in study groups and evaluate each other in the learning process. For example, in the “Human Computer Interface” course students developed a user interface prototype for a system of their choice in Visual Basic environment. Their work was evaluated by two tests, each of which required participation of at least three students mimicking the roles of the project author giving the demo, the critic exposing the weaknesses of the presentation, and the advocate emphasizing the commendable techniques learned in the course. All students had to participate in each role thus receiving hands on experience in the design and constructive critique by their peers.

During my first year at the University of Pittsburgh in 1996, I was a teaching assistant for the introductory course “Programming in Pascal”. This was a substantial teaching load with two course sections of 60 students each. My responsibilities included grading quizzes, projects and midterms, advising, and teaching recitations.

From 1998 until 2002 I was a teaching assistant for the “Advanced Digital Design” course for computer engineering students. During the semester the students progressed through the design stages of multi-cycle and pipelined MIPS processors with data and instruction caches. The designs were implemented on FPGA using the Mentor Tools software. I developed software and firmware tools for the course, which made it possible to upload the design to FPGA and to interact with it from a graphical user interface. Thus, the students were able to verify their designs in a realistic environment.

My contributions to the “Advanced Digital Design” course were delivering lectures for several sections of the course, including “verification of digital design” and
“cache memory architecture”, developing and maintaining web contents for the class, grading tests and projects, and assisting students working with the Mentor Graphics software tool set. Thanks to my experience with both FPGA and VLSI design, I was able to discuss the design issues from different angles of real projects.

In 2004, I was entrusted to develop and teach a new course “Introduction to Systems Software” for computer science and engineering students. This course introduced the students to the programming language C and operating systems (OS) concepts. Student and I discussed device interfaces and hardware synchronization at the lowest level of the operating system, the linkage of operating system services to application software, and the fundamental mechanisms for computer communications. Students developed projects for a PDA running Palm-OS operating system. For example, one of the projects required developing a PDA-chat application over infrared or Bluetooth link. Another project was development of services that enabled a PDA to be used as a graphical input device controlling a desktop computer over a TCP/IP connection. The students demonstrated higher motivation and enthusiasm working on projects that were interesting from both design and application points of view. The course has been incorporated in the core curriculum of the undergraduate computer science program at the University of Pittsburgh, and is being taught in the form I designed it.

While developing and teaching the “Systems Software” course I participated in a faculty development seminar, which discussed the theory and practices of teaching in a university environment. After the completion of the seminar I was offered to participate in the introductory lecture series for new teaching assistants. A copy of a recommendation letter by the person auditing my course is available upon request.

Recently I have enjoyed giving guest lectures and presentations to students during my postdoctoral appointment at the University of Virginia. The topics were related to the Wireless Sensor Networks (WSN), which is my current research focus.

In the future, I am primarily interested in teaching computer architecture and systems related courses at the undergraduate and graduate level, but would also enjoy teaching courses in other topics, such as data structures and programming. Due to my hands-on experience and interest in the subjects, I also have a potential to teach advanced courses, such as embedded systems, reconfigurable computing, and intro to VLSI design.

For undergraduate level computer courses such as “Computer Organization” I would discuss basic concepts, challenges and techniques followed by their application in course projects. For graduate level courses such as “Reconfigurable Computing,” “Asynchronous Digital VLSI Systems,” and “Low Power Systems Design” I plan to integrate recent research publications into the course syllabi.

Due to my current activity in WSN research I am very interested in developing an advanced seminar course, based exclusively on recent publications. It would focus on the latest hardware and systems architectures in WSN, communications, energy scavenging, and WSN applications in medical and environmental domains.

For every course designed and taught I set the goals for the students to be able to read, interpret, evaluate, and create. My premise is that every student in my class has a potential to attain these goals, and I will do my best to guide them there.