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TEACHING STATEMENT

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My teaching experience is varied. Over the last ten years I have taught a wide range of courses, several of them of my own design. Subject matters of these courses include:

- Classical Mathematics (Algebra, Calculus, Number Theory, Graph Theory);
- Applied Mathematics (Cryptography, Mathematics for Physical and Social Sciences, Modern Heuristics);
- Computer Science (Data Structures and Algorithms, Analysis of Algorithms, System Administration);
- Computer Programming (C++, Java, Perl, SQL, Programming for the Internet).

My primary objective in teaching a course is to expand students' understanding and appreciation of the world we live in, to make them wish to learn more about it, and to provide some of the necessary intellectual equipment to reach their goals. I hope that I learned how to do this by watching the many excellent teachers I have had. In practice, my teaching has emphasized several themes.

* The key word in my approach to teaching and learning is *understanding* (as opposed to formal memorizing). In particular, I feel that it is necessary for a teacher to provide a good motivation behind principal notions of Mathematics and Computer Science and to discuss driving forces of their development. Since students are more likely to be interested in solution of their own problems than in formal study of already solved problems, I think that an explanation of genesis of abstractions should begin with a concrete (and meaningful) problem and follow the natural flow of ideas of its original explorers. Encounters with a live and querying thought are always refreshing and inspiring for one's own discoveries in sharp contrast with perfect but formal retrospective explanations forged after the problem had been solved. Among many good examples of what Mathematics and Computer Science are all about one can mention connection of the ancient art of Number Theory to today's public-key cryptology and security on the Internet, or refer to stunning computer graphic and amazing special effects of modern designers to illustrate the importance of the link between Algebra and Geometry exhibited by Descartes via introduction of the coordinate system, or one can show how statistical properties of random numbers virtually guarantee average-case performance of important randomized algorithms (such as Quicksort).

* A teacher cannot take students' interest in the subject for granted and just present an elaborate collection of advanced techniques (which would be sufficient for specialists). Rather, in addition to ability to use powerful methods of Mathematics and Computer Science, a good teacher should provide students with some idea of how practical needs of social life and abstract thought arising from them constantly influence each other, how abstractions result in practical tools and are in turn deepened themselves by their very application. I believe that such an approach would better prepare our students to develop a line of scientific inquiry when facing an unknown phenomena in any area. I feel that discussions like these are particularly important in core courses of college level since most students taking them are not Computer Science or mathematical majors. Moreover, for some of them this will be the last rigorous mathematical or Computer Science course in their lives. Certainly all of these would be equally useful for students majoring in Mathematics or Computer Science, since ideally people should understand not only *what* they are doing, but also *why* they are doing this and how their work is relevant to others.

* Regular *exercises* and consistent *practice* are very important. Indeed, immediately after the understanding of main ideas should come a solid *technique*, which is another very important objective of my teaching practice. Hermann Weyl puts the matter for me: " Only after one masters techniques is he able to see the *real* problems". But the only way to learn how to solve problems lies through continuous effort to work out solutions of actual problems. Regular practice in problem-solving is also crucial for the understanding of ideas involved, i.e. for my primary objective – *understanding*. Thus, as a teacher I try to provide a good supply of meaningful, challenging (and at the same time solvable) problems of increasing difficulty which would reflect the material of a particular course. In my experience, at least half of the time devoted to preparation for teaching a class aims at the design and choice of appropriate problem sets. But then, a good half of the pleasure of working with students is derived from their increasing ability to address these problems and to face or to pose new ones, even those unexpected by the teacher.
* The last important idea I always try to convey to our students is that a fixed amount of knowledge is never enough. For effective problem solving one should be able to make educated (and even wild) guesses and be always prepared to "engage in a fresh understanding" [1].

To sum up, I see an effort to understand ideas and cultural context, a regular and consistent practice and an open mind as some of the most important keys to enjoyment of learning, teaching, and living.

REFERENCES

[1] D.M.Enerson, ed., *Teaching At Chicago. A Collection of Readings and Practical Advice for Beginning Teachers.* preprint, The University of Chicago , 1990.