KIVANÇ A. AVRENLİ — TEACHING STATEMENT

TEACHING INTERESTS

• Transportation Engineering, • Highway Geometric Design, • Traffic Engineering, • Transportation Planning, • Statics, • Surveying, • Probability and Statistics, • Applied Statistical Modelling, • Engineering Risk Analysis, • VBA Programming.

TEACHING PHILOSOPHY STATEMENT

I see effective teaching as the primary requirement for nurturing tomorrow's researchers. My utmost priority in teaching is to achieve lasting-learning. To accomplish this, I continuously arouse interest in the classroom by following these principles:

1- The most distinguished aspect of my teaching is the innovative use of technology for teaching difficult concepts. This includes, for example, the use of 3-D animations in teaching highway geometric design, and the use of Visual Basic animations in teaching probability distributions. Consequently, such difficult concepts are conveyed to the students in an easy-to-understand, and attention-grabbing way. The University of Illinois at Urbana Champaign has also recognized such innovative use of technology in teaching by awarding me with the *CEE Alumni Award for Teaching Excellence.*

2- The core of my teaching philosophy is "*concept-based*" teaching as opposed to "*content-based*" teaching. While content-based teaching does not go beyond superficial transmission of the facts, concept-based teaching focuses on making sense of the facts and relating everything to the bigger framework. Take the case of teaching the χ^2 Distribution in Probability, for example. I not only transmit the fact that χ^2 Distribution requires normality, but also demonstrate *why* χ^2 Distribution requires normality. Doing so also contributes significantly to the analytical thinking skills of students. The effectiveness of concept-based learning is also evidenced by the student feedback in my official course evaluations, such as:

- *"What makes his teaching powerful is that he teaches not only how things are, but also why things are the way they are."*
- *"Kivanc does a very good job of explaining the origin of the concepts, and relates everything to the bigger picture".*

3- I frequently create polls on common misconceptions. For example, when I teach "roadside design" in Highway Engineering, I raise the following question to my students: *"Do you believe that roadside signs should be built rigid and firm so that they do not sustain damage when struck by a vehicle?"* While it is tempting to answer "yes!" to this question, the correct answer is "no" because all roadside signs should be able to break or bend upon impact to mitigate crash severity. Revealing the correct answer acts as a wake-up call and planned surprise, which in turn arouses interest in the subject matter.

4- In teaching difficult concepts, I frequently make use of simple but powerful analogies. For example, when I teach the concept of "degrees of freedom" in Statistics, I make use of a rugby-football game analogy, which students from different disciplines can easily understand. The effectiveness of such analogies is also evidenced in my official course evaluations, such as:

- *"After taking several statistics classes, I was able to understand for the first time in your class why we use 'n-1' instead of 'n' in computing the sample variance."*
- *"His examples (rugby game, flights) were very interesting and helped me understand the concepts well."*
- *"He used very helpful tools to explain somewhat complicated topics in a clear manner."*
- *"Kivanc explains everything in a way that everyone can understand."*