**Interview with Dr. Martinez-Miranda: conducted by Veronica Mars on 9 November 2012**

**1. How often do students come to you with concerns about material form prerequisite classes?**

They don’t come to me that often, but when I ask if they’ve covered it they are confused and I can tell that they are uncomfortable with being asked to apply that knowledge.

**2.    Do students tend to have problems applying concepts from other class (or earlier material in your class) to their current work?  If so, describe in more detail or give examples.**

Yes, especially when solving problems requiring mathematics and they don’t see how to apply the math in a physical sense. Students seem to have problems applying abstract concepts and ideas to the physical world that is so necessary for engineers and application.

**3.    How important are mathematic and trigonometric identities?  Calculus?  Differential equations?  What would you like to see students know more of in each of these areas, if anything?**

Very important; x-rays depend on trig. Also, many derivations come from geometric sources. It’s not a question of knowing, but rather that you need to know what you need to use. I’d think it would be easier, but there are too many sources and people are confused about where to go. It would be nice if there was a more cohesive and reliable source for students.

**4.    What do you do to help students who do not know as much as you believe they should?**

Several approaches (depending on the time) I don’t do it for lab classes, not enough time

If I’m going to use a certain math/diffeq eqn, I sometimes stop the class and present the equations and specific solutions we are going to use with the bounds we will use. In engineering we have to use the bounds with the Initial and final conditions

I have ALSO done (works better if I know a textbook) giving them references to math books that I know are in the library

**5.    How much time do you spend reviewing old material in class each semester?**

Less than 20% of the time (which would be an extreme maximum) because if not I won’t be able to cover the material.

6**.    Have you spoken with other instructors about problems that their students are having?  If so, what has their response been?**

Yes, it’s a pretty general problem. There are so many sources, that students get too much information distibution, and they don’t know where to look. Students don’t seem to know as much now as they used to.

**7.    What are students most worried about remembering?**

Basic diffeq’s (like Hooke’s Law, d(rho)/dt change in concentration vs. time, the Gas Law

Diffeq can be bad here for engineers because it’s taught by mathematicians. They need to learn how to apply them, rather than how they can manipulate them abstractly.

**8.    What do you think your students can do in order to better prepare for your class?**

Learning how to apply boundary conditions to physical situations

**9.    What resources do you wish your students had or knew about?**

Unfortunately I have not run into any resources that I find cohesive. I think students need to know a lot of things from a lot of classes, but then it is up to them where they find their information.

I rely more on books because web links appear and disappear.

**10. What classes do you feel that students need a strong background in so that they are well prepared for the material you teach?**

Diffeq, calculus, error propagation

***Comment in reference to our project goals:***

I’m glad you’ve observed this. We’ve (professors) observed this as the subjects become more complicated, people tend to differentiate between classes when they all interrelate to each other with mathematics. Engineering is about applying all the information you learn and building upon previous classes as you go up, not about passing classes and dissociating the information you learn in each one from the others. It’s a problem, definitely.