I’ve been teaching at FIU since 2003 and during that time I’ve strived to be the type of teacher that I enjoyed having when I was in school. These teachers always knew the material they were teaching like the back of their hand, and they found a way to make it interesting as well as to show why the subject is important in their lives and why they’re learning the material. Since I teach human physiology as it applies to engineering and developing medical devices to alleviate disease, it’s very easy to demonstrate the utility of understanding one’s body in the same way an owner’s manual gives information about a new car.

Over the years I’ve adapted the course to meet the demands of a rapidly changing world in terms of access to knowledge via the internet, advancements in the understanding of disease pathophysiology and the advent of artificial intelligence. During the pandemic, instructors were forced to adapt to new technologies such as remote classes using Zoom. I’ve been able to incorporate this remote meeting capability to record all my lectures and allow students to access the recordings to study for the tests. SPOTs surveys indicate that this is very valuable in assisting students to understand the material. In developing questions for tests, I focus more on application of knowledge as opposed to rote memorization. Since students have access to a vast repository of knowledge via the internet, memorization of material becomes less important than understanding how things relate to one another and the implications being able to predict how the body may respond to a medical device and the potential adverse events that may occur as a result of implantation.

In addition, I allow students to bring in two sheets of notes from topics covered in the book and in class. This forces students to determine which information they feel is critical without having to just memorize it. I try to give questions where they use the basic information to predict symptoms or abnormalities that may arise by perturbing homeostasis and the compensation that the body does to regain normal function.

The class also does certain learning assignments in groups so that they can better understand difficult concepts such as osmolarity and tonicity and the movement of water across various body compartments. Forcing them to defend their answers to their fellow students helps those who may not understand the material gain perspective from someone who does understand. I find that when a class didn’t do this group exercise but were forced to do the questions individually during Covid, the test results were much worse than when the class was able to work together after Covid passed.

I also encourage students to attend class by randomly giving a couple of extra credit points for selected classes they are present at since those students who attend lecture end up doing much better on the tests than those who don’t. I learned the power of motivation in a course I took in college called Psychological Engineering. Small extra credit marks that can be earned from doing certain activities help students remain motivated and feel they have control over the grade they receive in the course. Since students are mainly motivated by grades, this is extremely important to them. At the end of the semester, they can raise their grade to the next higher mark, (i.e., B+ to A-) if they accumulate enough points. I also try to reinforce concepts learned previously by asking questions that review previous topics that relate to the concept under discussion.

I also give learning assignments that delve more in depth to concepts mentioned in the text. This helps students see the real-world implications of things like salt and sugar consumption, fat consumption, risk factors for atherosclerosis and the symptoms of heart attacks. Case studies bring these examples to life and will help the students put in practice the latest research as to how to mitigate their risk of getting various diseases such as hypertension, diabetes and coronary artery disease. These are topics that physicians previously used to discuss with their patients but which they have very little time to do in the present environment of fee for service medicine. This will hopefully allow them to live a more active and healthy lifestyle.

I like to make my tests challenging in such a way that one will not be able to do well just by regurgitating the information. I try to generate questions that make the students apply the information learned to real-life clinical situations. The scores on most of my tests invariably yield scores in a bell curve pattern with scores ranging from 50%-100%. This forces the students to read the book and review the lectures and power-points. I am far more lenient on grading the learning assignments and term paper where they research biomedical devices that have been approved and used clinically and report of the success or failure of the device to alleviate symptoms and any adverse events that may have occurred following implantation of the device.

Based on the results of the Spots surveys from the last 20 years, students are very enthusiastic about the course and the way it is taught. Many have commented that my classes are some of their favorite classes they have taken while at FIU and that I was the best teacher they have had at FIU or in the Biomedical Engineering Department.