



Teaching experience and philosophy

As a faculty member at Saint Mary's, I have taught university physics and astronomy at every level since 1993. Over my career, I have prepared some fifteen undergraduate courses and three graduate courses, most of which are listed on my teaching page.

During these years, I have noted with increasing alarm the trend in university teaching to rely more on electronic media and gadgets, and less on curriculum content and good study habits. While it is true that engaged and entertained students learn more in class, the trend also seems to include less comprehensive curricula and the assumption that students need do little more than come to class to learn the material. To my mind, this has resulted in more coddled, less prepared students whose expectations of getting at least a B are too often met.

I do not subscribe to such “teaching innovations”.

My lectures are traditional. They are dynamic, mathematically oriented, and challenge the student to *think*. I work to follow the department's posted [curriculum](#), carefully designed to prepare students to compete with the world's best for graduate school and careers in physics. I eschew the notion we are “only a small undergraduate university, and need not teach to the standards of the larger institutions.” While such a stance may make for more entertaining classes and an “easy A”, it can do a great disservice to the serious student in the long run.

As outlined in our [curriculum](#), there are certain “outcomes” a student must achieve from each course in order to move successfully to the next level. I strive to meet each objective and, in so doing, my courses may seem fast-paced. I believe the classroom is where only about 20% of learning takes place. The other 80% occurs outside the classroom, where the student rewrites his or her notes, pours over the text and homework problems, consults liberally with me outside the classroom, and studies and practises the material relentlessly.

Physics is hard; there is no way to candy-coat this. For every hour in class, the successful (astro)physics student will work diligently four hours or more outside class. I can do little more in my lectures than set the pace; the rest is up to the student who *wants* to be a physicist or scientist more than anything else at this stage of his or her life. If this doesn't describe you, then you might think of something else for a career.

The reward? To think like a physicist is to acquire a life-long “clarity of thought”, unknown to virtually everyone outside the discipline. It includes an uncanny intuition of how the universe works that lends itself to everyday activities. It includes the ability to recognise a logically self-consistent argument, no matter who makes it, no matter the subject. Above all, it includes the ability to learn easily and quickly, and to adapt to any intellectual challenge, be it putting together your snow-blower, or discovering a new phenomenon in physics.

If you come to my class with an open mind and prepared to work hard, I will do everything in my power to help you succeed, no matter how many out-of-class hours it takes. You don't need to be brilliant to do well in my courses. You need some aptitude and a good work ethic so that at the end of the day, you will learn more than you expected, and do well doing it.