



# Montague-CTE Scholar Charles M. Folden III (2011-2012) Cyclotron Institute, College of Science



## *More Than the Bomb: A First-Year Seminar on Nuclear Science*

I used my Montague-CTE Scholar award to design and teach a first-year seminar (FYS) based on the ways that nuclear science has affected society, both technically and non-technically. Texas A&M has several technical courses in nuclear science for graduate students and advanced undergraduates, but none for first-year students. I originally intended to name the course *Nuclear Science and Society*, but after consulting with the first-year seminar program office we chose *More Than the Bomb: How Radioactivity, Nuclear Power, and Nuclear Weapons Define Your World*.

### Preparation

I was very familiar with the technical content of the course, but I was apprehensive about discussing the non-technical material. I wanted the students to think about ideas such as:

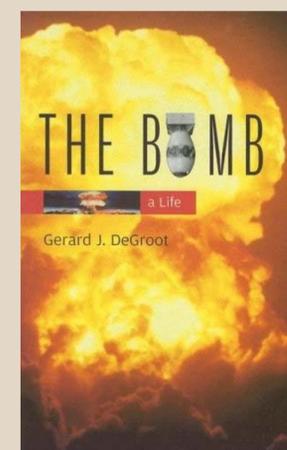
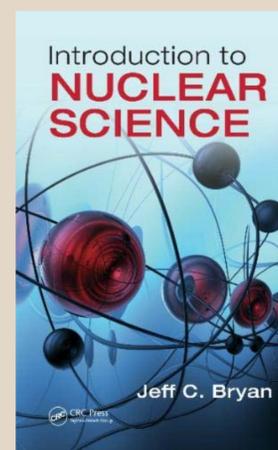
- Geopolitics and nuclear weapons during the Cold War.
- The threat of nuclear terrorism.

For help with these and other topics, I met with two professors who provided both a contemporary and an historical context:



Left: **Jasen Castillo**, Assistant Professor at the Bush School focusing on defense policy. Right: **Jason Parker**, Associate Professor of History focusing on modern American history.

### Course Materials



For technical content we used *Introduction to Nuclear Science* by Jeff C. Bryan, and for historical and geopolitical discussions we used *The Bomb: A Life* by Gerald J. DeGroot. The latter succinctly describes how nuclear weapons have influenced policy decisions made by the superpowers.

### Technical Content

The lectures discussed some technical topics at a FYS level:

- Radioactivity and half-lives.
- Particle accelerators and nuclear reactors.
- Where did all of these nuclei come from?
- Using nuclei to diagnose and treat disease.
- Why is the problem of nuclear waste so complicated?
- Three Mile Island, Chernobyl, and Fukushima Daiichi.
- One lecture was used for a tour of the Cyclotron Institute.

### Non-Technical Content

Our classes discussed several topics that were non-technical:

- Nuclear weapons, national security, and terrorism.
- The influence of nuclear weapons on the Cold War.
- The influence of politics on nuclear science.
- Fear of nuclear technology.
- I also used the video game *Defcon* to illustrate the speed and lethality of a nuclear war:



### Final Lessons

The course was taught in Fall 2012 with an enrollment of 13 students. It met for one hour per week and included a small amount of homework and group assignments. The response from the students was generally positive, and at least one student changed his major to Nuclear Engineering after the course.

Unfortunately, the university ended the FYS program after the 2012-2013 academic year. I still have all of the course materials as well as a desire to teach nuclear science to first-year students (and the general public). If the FYS program returns, then I hope to teach the class again in the future.