4j Development of Corrosion Resistant Implant Materials Using Biocompatible Thin Films
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There are three major endeavors of any university which include research, teaching, and service to others. As a graduate student at Mississippi State University, I have had the opportunity to perform work in each of the three different segments.

My dissertation project deals with different methods of coating metal implant materials. Currently, we are working on applying chitosan, a biopolymer, to three different metals. We are using different methods, which include dipping, a silane-reaction, and plasma deposition to modify the chitosan thin film. The film hardness and bond strength will be tested with a nanoindentor. I have structured my classes around my dissertation project. In order to better analyze the data collected from the nanoindentor, I have taken multiple statistics classes. Since my dissertation project deals with preventing corrosion within the body, I took Corrosion of Biomedical Implants, to understand what causes corrosion. Finally, I took Scanning Electron Microscopy (SEM). SEM is necessary to determine, after nanoindention, where failure of the film occurred. I also took immunology, in order to better understand the reaction caused by foreign material, such as metal implants, in the human body. These classes are in addition to the minor I received in Microbiology as an undergraduate student.

I have had many opportunities to assist the professors in Chemical Engineering and professors in other departments and other schools. I have been a teaching assistant for the Unit Operations laboratory, along with teaching both Unit Operations I and Unit Operations II. I also helped create, and the subsequently taught, the simulation lab that accompanied Mississippi State University's Process Design class. My experience with X-Ray Photoelectron Spectroscopy (XPS) has helped me meet many different professors around the campus, the country, and the world. I have worked on projects with professors from Plant and Soil Sciences, Agricultural and Biological Engineering and the University of Texas Health Science Center. I also have assisted professors from other countries, such as Chile.

As an assistant professor, I plan to continue to combine teaching, service to others, and research. I am interested in teaching several different classes, in helping others as I have at Mississippi State, and continuing my research in modifying the surface of metal implants in order to promote osseointegration and prevent biocorrosion, using my experience in the laboratory as a graduate student and my experience as an undergraduate earning a minor in microbiology.