

# Faculty Development Plan

## Self-Assessment

### *Teaching*

I feel that I have a natural ability to show enthusiasm in class and keep the class interesting. What I have not learned well yet is to incorporate active learning techniques into my teaching, and to believe that they help. I enjoy teaching the introductory courses slightly more than I enjoy teaching the more upper division and graduate level courses. I also strive to incorporate the gospel into my teaching.

### *Scholarship*

I have two main areas of research that I am interested in: crack/defect imaging and characterization (Nondestructive Evaluation [NDE]) in solid media, and various applications of focusing sound in air using time reversal. My strong relationship with Los Alamos National Laboratory affords me a strong collaboration and source of funding through subcontracts and co-writing of proposals. There are several areas of research at BYU that I have the opportunity to begin new collaborations and branch out into new areas of research.

### *Citizenship*

I have established myself quite well within the Acoustical Society of America (ASA) professional society. This is the premier society in acoustics research. I organize and chair a few technical, special sessions at conferences every year through the ASA. I am an associate editor for the top journal in this society and regularly review many papers from several journals. I was recently included as one of two candidates to serve as chair of one of the ASA's 13 technical committees, demonstrating recognition of my leadership in the ASA. I am also a technical program co-chair for the upcoming ASA meeting in Salt Lake City. I currently serve on the department's undergraduate committee.

## Professional Goals

### *Teaching*

I wish to learn more about active learning techniques, one so that I am more convinced that they actually help student learning, and two so that I can best help the students in their learning of the course material. I wish to lean on my perceived strengths as I start out my career at BYU by requesting to teach the introductory physics courses. As I get my research program more established I wish to develop my interest in teaching upper division courses by teaching a new upper division course, such as 318, 330, or 461. I plan to use the university's Spiritually Strengthening Faculty Questionnaire to help me develop in my ability to weave the gospel into all aspects of my teaching.

### *Scholarship*

In the first few years at BYU, I wish to continue my work in NDE, and to use my startup funding resources to conduct research that will lead to funded research opportunities in sound focusing in air. I will continue to write proposals with Los Alamos and plan to visit the lab once a year

during the summer to make plans for future proposals and keep that relationship strong. I am currently in the process of writing a proposal with Scott Sommerfeldt and others in Electrical Engineering to apply my sound focusing in air research to solve some issues related to the noisy operation of MRI facilities. I also wish to find areas that Kent Gee and I can collaborate on proposals. One area Kent and I are looking at pursuing is to study blast noise through a new collaboration at Los Alamos through former connections I had there. Long term I have interest in applying acoustic techniques to characterizing nano structures and to see how acoustic techniques might aid astronomy research, such as planetary seismology and acoustic waves in gaseous galaxies.

### *Citizenship*

I wish to continue my strong involvement within the ASA. I strive to find new opportunities to be involved and rotate off of other responsibilities. BYU has a strong relationship with the ASA and I wish to further BYU's involvement and visibility within the ASA. I would like the opportunity to serve on various committees within the department and perhaps at other levels (college, university, etc.), however, in my first few years I hope to not have too many responsibilities in this area that might slow down my development as a teacher and as a scholar.

## **How Goals Fit within Department and University Aspirations and Needs**

### *Teaching*

I found my reading through the university's founding documents to be very inspiring. It is clear that teaching at BYU is intended to be interwoven with the gospel and that teaching methods can be rooted in gospel practices. Active learning methods are similar to the Come Follow Me gospel program that seeks to flip the classroom and engage the students in learning.

### *Scholarship*

My research areas provide opportunities for students to develop as researchers and work on cutting edge research in newly developing fields of acoustics research. Much of my research is well suited for undergraduates to get involved in meaningful research and publish journal articles.

### *Citizenship*

My citizenship goals allow me to provide service to my department and particularly provide individual service to many students in my department as I meet annually with 55 of them. Additionally I am able to offer service to my professional community, providing an example to the students who work with me.

## **Resources**

### *Teaching*

The department and university has the resources I need in place. These include the surveys (midcourse, end of semester, and spiritually strengthening surveys), demonstration equipment, Learning Suite, and i-clickers.

### *Scholarship*

I was provided a healthy amount of startup funds to purchase the equipment I needed and to pay students to get started on research with me. There are some delays inherent in getting this equipment ready and purchased but I am able to move research forward while these things are in progress.

### *Citizenship*

I was provided with a department committee assignment and I already have significant responsibilities within the Acoustical Society of America.

## **Progress toward Goals**

This section will be updated annually as progress can be reported on from previous years.

### *Teaching*

I have taught Physics 167 three times, Physics 561 twice, Physics 660 twice, and Physical Science 100 once. My student ratings in 167 have steadily improved over the three offerings. In 561 and 660 my ratings were high each time. My PS 100 ratings were quite high for that course's average. Students consistently comment on my incorporation of the gospel and enthusiasm for the course material.

### *Scholarship*

I have been able to publish 55 papers, 37 of which are peer reviewed articles. I was able to published a peer reviewed journal article with both of my 2 graduate students and all 5 undergraduate students I have worked with. I currently am working with 2 grad students and 4 undergrad students and have plans for each of them to publish their work. I was able to bring in \$215k in research funding as a principle investigator and another \$71k as a co investigator. I am working on proposals and exploring new funding avenues.

### *Citizenship*

I have been serving as an associate editor for the top journal in my field for 4 years, have organized 5 special sessions at ASA conferences, and am a technical program co-chair for the ASA meeting in Salt Lake City 2016. I also am currently serving on the undergraduate committee in the department.