Faculty Development Plan

NAME
Department of Physics and Astronomy - June 2016

I am a driven person and find satisfaction in identifying areas for improvement and developing creative solutions. I often find myself with more ideas than I have time to complete. This document will serve to focus my efforts on long-term priorities. It also identifies areas of personal strength and weakness.

Below, are my outlined goals in the areas of teaching, professional service (i.e. – Lab management), and citizenship. A plan for achieving my goals and resources needed to accomplish them are also included.

Teaching

Expectations

I am expected to teach four courses each year with the bulk of the courses being lab classes and a smaller subset being lecture courses with lab components.

Self-assessment

My teaching experience includes recitations to undergraduate students, teaching lab courses to undergraduates, and teaching Sunday school. I have found that I excel at providing context and motivation for the topics and skills to be learned, listening to students and understanding where they are struggling, and leading student guided discussions. I particularly excel at working with introductory students. My excitement for the material helps motivate student learning.

I also recognize areas where I could improve. Among them are:

- Assessing student learning in a quantitative, actionable way.
- Choosing an appropriate number of changes to implement in a given semester.
- Scheduling sufficient time to prepare for future semesters.
- Helping students come to class prepared to learn.
- Grading papers in a timely manner.

Long-term vision

Educational labs in our department seem to have focused heavily on demonstrating the physics principles from course work. Recently, however, our Lab Committee determined the need to incorporate the construction of knowledge as a learning goal in lab classes in accordance with recently released American Association of Physics Teachers (AAPT) recommendations. Over the next several years, I intend to adapt our lab courses to include a greater focus on teaching students to develop their own intuition by making meaningful inquiries, designing experiments that will answer them, and analyzing the results. I will seek to use best known instructional practices in this pursuit.

Goals

1. Stay current with lab teaching techniques and best practices by:
    a. Attending ALPhA immersion programs and AAPT conferences.
    b. Presenting at AAPT meetings annually to get feedback.
2. Create new learning outcomes for labs that are in line with Lab Committee and AAPT guidelines.
3. Adapt Physics 140 and 108 course curriculum using a constructing knowledge approach.
    a. Identify concepts and skills that meet learning objectives and outcomes.

b. Identify/develop/adapt lab activities which accomplish objectives.
c. Gather feedback on student learning gains through surveys and interviews.
d. Rearrange the course schedule to allow more:
    i. Laboratory exploration of phenomena.
    ii. Student development of models.
    iii. Class discussion on conclusions based on observations.
    iv. Testing of models to identify limitations.
e. Write/adopt pre-lab and post-lab assignments to encourage preparation for class and help assess student learning.
f. Create improved learning assessments.
g. Develop/identify help-guides for Lab TAs and Instructors. Some may include:
    i. Videos of how the lab is done (procedural and examples of how to run a modeling curriculum).
    ii. Troubleshooting guides for equipment.
    iii. Recommended thought provoking questions to ask students.

4. Add resources to assist with TA training and instructor preparation in other lab courses.
5. Read one book about teaching and/or learning per year.

Professional Service

Expectations

The professional component of my position is focused on management of the physical aspects of the educational laboratories in the physics department. This includes:

- Hiring, training, and directing students who assist in setup of laboratory equipment and maintenance.
- Overseeing laboratory classrooms on the 4th floor of the Eyring Science Center.
- Managing laboratory equipment.
- Repairing, purchasing, and developing new equipment.

Self-assessment

I am good at providing motivation to and connecting with students. This is essential to being a good manager. I also have experience in training. I am proactive and able to keep a long term view of potential improvements in the laboratory space. I am also good at budgeting my expenses.

Areas in which I recognize room for improvement are:

- Holding students to job expectations
- Setting up protocols
- Scheduling, including overscheduling myself

Long-term vision

The fourth floor laboratory space was historically run on a fairly limited budget which required that significant time be spent in developing and repairing equipment. The previous approach also resulted in labs becoming outdated. I will shift the approach towards a purchase and replace model that is in line with our department direction. This approach will require more budgeted funds for equipment but will significantly free up time for a stronger focus on curriculum. Over the next several years, I intend to update equipment on all of the fourth floor labs. I also intend to set up protocols, training documents, and schedules which will make the best use of budgeted funds. My ultimate goal is to reduce the

number of TA and faculty hours required for setting up and repairing equipment. The time will instead be used to assess and improve laboratory curriculum. I hope to create an environment where physics teaching majors and applied physics majors can complete capstones related to physics teaching.

Goals

1. Hire, train, and direct setup TAs
    a. Recruit high quality TAs for setup with a focus on future teachers.
    b. Create training documents on repair/troubleshooting and maintenance of lab.
    c. Create video tutorials on how to use and setup equipment.
    d. Create and maintain an expectations document for student workers.
    e. Hold a monthly staff meeting for students to review expectations.
2. Oversee laboratory classrooms
    a. Create training documents on lab course instruction and equipment use.
    b. Create lab course schedules which allow adequate time for TA training each semester.
    c. Schedule content and equipment support for lab TAs from setup TAs.
    d. Maintain and assist in updating/editing/testing curriculum for 4th floor labs.
    e. Develop and maintain a wiki to manage course schedule, content, and equipment.
3. Managing laboratory equipment and space
    a. Create a schedule for ongoing updating lab equipment and room amenities in all labs (*e.g.* - Update equipment for 4 walk-in labs each year)
    b. Create/buy and maintain a lab inventory system to aid in scheduling lab equipment.
    c. Create a lab survey for each of the upstairs labs to identify equipment that is failing and/or difficult to use and to identify student perception of the labs and lab materials.
    d. Reorganize lab equipment to reduce setup time.
    e. Make desk space and computer access more convenient for group work.
    f. Create yearly budget proposals for foreseeable expenses.

Citizenship

Expectations

My expectation in regards to citizenship is to fulfill assignments within the department, college and university. I am also expected to be involved within the larger physics teaching community.

Self-assessment

I consider myself an effective committee member. I work well with other people.

Long-term vision

Our department has a large number of undergraduate students. Because of that, we have an opportunity to generate statistical data that can contribute to understanding ways to improve student learning both at BYU and in the larger physics teaching community. I intend to seek collaborations within our department and university to improve undergraduate education in the physics department. I also intend to seek outside collaborations and contribute ideas and findings to the AAPT and ALPhA organizations.

Goals

1. Continue to contribute to the Lab Committee.
2. Continue to head up the employee giving campaign.

3. Socialize with AAPT and ALPhA members at conferences.
4. Volunteer to serve on review boards for the AAPT.
5. Volunteer to host an advanced lab immersion program at BYU.
6. Attend faculty meetings and contribute to discussions.
7. Attend courses with a lab component regularly to assess and provide feedback to other faculty.
8. Develop/adopt and run a regular lab TA training on best teaching practices.

Resources

I feel like I receive great support from my department and colleagues. Additional resources that will help me accomplish my goals are:

1. Clearly defined budget for lab upgrades and repairs (Reviewed on a yearly basis). My startup package is a good starting point but to stay current with labs it is important to have an ongoing financial commitment to improvements.
2. To determine an appropriate budget, I will need the individuals responsible for each lab course to provide their long-term plans (>1 year) for upcoming changes to lab classes.
3. Training on best management/scheduling practices.
4. 40-45 hours of setup TAs over the next year and potentially on an ongoing basis.
5. Support for RAs to develop labs on an as needed basis.
6. 10-15 hours of walk-in lab TA hours.
7. Feedback on my teaching and course structure from my mentor and other faculty members.
8. Assistance from the Center for Teaching and Learning in creating, collecting, and analyzing evaluations from TAs and mid-course and end of semester student surveys.
9. Department support of lab TA teacher training meetings.
10. Colleague recommendations on individuals that would be interested in collaborating on lab immersion programs.