

# Sample 1

# Faculty Development Plan

In this plan I present my goals and plans to improve in the three areas of teaching, scholarship and citizenship. I will outline my objectives and how they will address my own strengths and weaknesses.

## Teaching

My goals for teaching include:

- 1) Be an effective teacher in the classroom. To achieve this goal:
  - I will thoroughly prepare for each class I teach. I will try to anticipate the needs of my students and how the material presented can best help them learn.
  - After each class taught, I will review what went well and what could have been done better. I will build upon what was successful and correct what was unsuccessful.
  - I will seek to completely understand student questions and after giving answers I will ask if their question has been fully answered. Not completely understanding student questions is a weakness of mine, and I will make this a special focus over the next year.
  - I will pay close attention to the feedback I receive throughout the semester from student emails, visits to my office, and conversations after class. I will make mid-semester changes to the class when appropriate and when beneficial to the students.
- 2) Be an effective instructor and mentor in my office hours.
  - I will adapt my answers in my office according to each student's needs and capabilities.
  - I will strive to find the correct balance between giving complete explanations and helping students discover the answers themselves. The latter is more beneficial for the students, but if they could discover it all on their own they wouldn't visit my office.
  - I will be sensitive to the emotional well-being of the students who visit my office. I will offer support and encouragement to those feeling discouraged. For those who are suffering more acutely from anxiety and/or depression, I will refer them to the counseling office.
- 3) I will have one senior faculty member visit each of my classes each semester.

- I will ask the visiting faculty member to write up a report on their visit.
  - I will pay close attention to the feedback I receive from senior faculty members.
- 4) I will mentor at least one student each year in a research program.
    - I will help at least one student research an original topic.
    - I will mentor the student as they write, submit for publication, and present their results in research talks.
  - 5) I will help recruit undergraduates to the mathematics major.
    - I will be fully-informed and able to explain all of the benefits of both a math major and acme major so that undergraduates are aware of the opportunities available by majoring in mathematics.
    - I will be aware of the majors of the students who are enrolled in my classes.

## **Scholarship**

My scholarship goals include:

- 1) Submit at least three papers for publication each year.
  - I will submit at least two publications each year to tier 1 journals. All articles will be submitted to tier 1 or to tier 2. Undoubtedly, it would seem best to submit all articles to tier 1 journals. However, under some circumstances it may be advantageous to submit to a specific journal. Such circumstances include special editions.
- 2) Submit at least one collaborative paper each year.
  - I've noticed that the past three articles that I've submitted are solo articles. Since collaboration is important for many reasons, I will ensure that I'm always working on a project with somebody else. Currently, I'm working on two collaborative projects.
- 3) I will submit at least one grant proposal each year.
  - I will pay close attention to any grant reviews that are not funded so that improvements can be made on subsequent grant proposals.
  - I will have colleagues look at grant proposals before submission to ensure the proposals are of the highest quality and likely to be funded.
- 4) Give at least three invited talks each year.
- 5) Attend at least two conferences each year.
- 6) Host at least two visitors each year for collaborative purposes.

## **Citizenship**

My citizenship goals include:

- 1) Serve effectively on assigned committees
  - My current assignment is on the graduate committee. I will seek to recruit more quality graduate students to the program.
  - I will answer all committee emails promptly.
  - I will complete all committee assignments quickly and report on outcomes.
- 2) I will continue to help run the PDE and applied mathematics seminar.
  - I will invite at least two speakers to the seminar each year.
- 3) I will attend department colloquia.
- 4) I will referee at least 3 papers each year.
- 5) I will help organize a conference or a special session at least once every two years.
- 6) I will write at least 6 reviews for MathSciNet each year.
- 7) I will attend writing group each semester.
  - By attending my writing will improve.
  - I will help others improve their writing.

# Sample 2

# Faculty Development Plan

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June 13, 2017

## 1 Self-Assessment

My greatest strengths include a successful research program that has aspects that are accessible to student research, student focused teaching, and enthusiasm for success of the Applied and Computational Mathematics Emphasis (ACME). I am skilled at numerical analysis and mathematical computation, as well as interacting respectfully with students. I am interested in developing a strong research program that will provide students with meaningful research experiences. As a math professor at BYU, I have the opportunity to be involved in furthering the success of the ACME emphasis. Building on these strengths, skills, and opportunities, I desire to develop an independent research program designed to give students significant research opportunities and become a spiritually and intellectually inspiring teacher.

## 2 Professional Goals

My big scope professional goals are to build a successful, independent research program geared toward supporting student research, develop teaching skills and materials that will lead to extraordinary teaching with the intent to provide students with the best learning opportunities possible, and to strengthen the ACME emphasis. To accomplish these big picture goals, I have the supporting goals of submitting at least three papers a year for publication, applying for at least one external grant each year, unless already funded, and mentoring 2-4 students each year. To improve my teaching, I have the goal of incorporating generational learning into my lectures, motivating the number theory content of Math 290 with cryptography, and seeking feedback on teaching through midcourse evaluations and classroom visits from other professors or the SCOTT program. To strengthen the ACME emphasis, I plan on continually improving my advising skills, developing lecture notes for Math 344 that include generational learning methods, and getting involved in some ACME activities outside of the classroom.

To build an independent research program, I will build on the success of my dissertation work involving computer assisted proof to study stability of traveling waves in important physical systems, such as multi-species reactive Navier Stokes, and multi-dimensional waves. I will develop methods for the rigorous verification of spectral stability properties. In developing these methods, I will look for ways to automate the process, and I will involve students in this research.

### **3 Department and University Needs**

My goals in scholarship, teaching, and citizenship are aligned with the department and university goals. The math department is committed to providing our students with outstanding research experiences, quality teaching, and exceptional job preparation. My service to the department has primarily been to support the AMCE emphasis as an ACME adviser, and soon as a teacher of ACME courses.

### **4 Resources**

To accomplish my goals, the main resource I need is time. The department and college have provided me with a startup package that provides for the monetary needs of hiring students and traveling for research. The main resource I need to accomplish my professional goals is time. The department has been careful to not overload the first year faculty with too many committee assignments or too many new class preps.

### **5 Current Progress on Goals**

In my effort to achieve these goals, I have already submitted two papers for publication this year and attended the spring grant writing workshop at BYU to help me improve my grant proposal. I made concerted efforts to improve my teaching following the advice given by those who observed my class, and especially based on student comments. Consequently, my student rating score improved from 4.1 in Math 290 during Fall Semester 2016 to 4.5, slightly above the course average of 4.4, during Winter Semester 2017. I have studied a little from a book on salesmanship to improve my ability to influence students for good when advising them.

## 6 Measuring Success

To measure my success on achieving my goals, I suggest using Faculty Profile to track my success in submitting papers for publication and external grant proposals as well as to track student mentoring efforts. Student course evaluations and comments and letters from other teachers attending my class are the best way to measure the success of my teaching. Student comments and ratings from the Math 344 class I will teach will provide the best measure of my contribution to the ACME emphasis.

### Signatures



Chair, Mathematics Department



Assistant Professor of Mathematics



# Sample 3

## Teaching

### *Self-Assessment*

One of the reasons I chose to come to BYU was to work and teach in an environment that was concerned about student's spiritual development as well as their intellectual development. In and out of the classroom, I will have opportunities to encourage and help students realize their individual potential. The problem-solving skills that students develop in mathematics courses will benefit them regardless of what they choose to pursue after their studies. Thus, one of my roles as an instructor is to help students recognize how they are developing life skills and character traits as well as learning specific mathematical concepts. Recognizing and encouraging my student's efforts, both successes and failures, will assist them to develop greater confidence and desires to try new and hard things.

One of my strengths in this process is my excitement for the subject material. Mathematics at all levels has an inherent beauty and elegance. I convey this to students through my attitude and approach to the subject. While I feel this is a strength, I also need to learn to demonstrate the elegance of mathematics to students without trivializing their difficulties in understanding and applying the principles, they are learning. I need to ensure that my word choice and demeanor is encouraging to students. I also need to continue to find engaging and interactive ways to present the material I teach.

### **Long-term Goals:**

1. Develop methods to encourage active learning.
2. Be able to communicate difficult concepts in a clear and concise manner.
3. Become a spiritually strengthening and character building teacher and mentor.

### **Plan to obtain goals**

The following concrete steps will assist me in developing the skills necessary to achieve my long-term goals.

1. Create detailed lecture notes that
  - integrate current lectures with previous lectures and
  - include various approaches to gauge understanding as well as encourage active learning.
2. Develop innovative approaches for in-class instruction by
  - talking with experienced instructors about their teaching methods as well as sitting in on their classes and
  - having my classes observed both by experienced faculty members and students working with the Center for Teaching and Learning (SCOT).
3. Encourage students to talk with me outside of class.
4. Have midterm evaluations and implement suggested improvements.

## Scholarship

### *Self-Assessment*

My research focuses on the algebraic topology of spaces with non-trivial local topological structure and on the coarse geometry of groups. Studying abelian covers and fibrations that arise from inverse limits of covering spaces will lead to a better understanding of the homological structure of planar topological spaces. In the next few years, I will develop a theory of fibrations and covering spaces for planar Peano continua.

It is an open question to what extent the Tits boundary is a group invariant. Asymptotic cones provide an efficient tool to study Tits boundary due to their quasi-isometry invariance and their close relationship to the Tits boundary. I will continue to develop the study of CAT(0) boundaries through asymptotic cones. The Tits boundary of CAT(0) groups is in general not well understood. I will continue to develop the correspondence between asymptotic cones of CAT(0) groups and their boundaries.

Scholarship, while rewarding, is challenging due to its unstructured nature. It is easy to spend my time in less effective ways that do not produce quantifiable progress. I have a tendency to fixate on a specific problem or method rather than continually developing new ideas, methods, and strategies to build a complete theory. As well, to be more productive, I need to develop my collaborative projects with other experts outside of BYU.

### **Long-term Goals:**

1. Develop a theory of fibrations for planar continua.
2. Study CAT(0) groups via their boundaries and asymptotic cones.
3. Disseminate my research through publication in quality journals and research conferences.

The following plans will provide incremental benchmarks to assist in using my time and efforts effectively to reach my research goals.

### **Plan for next year to work towards long term goals**

1. Write for at least 30 minutes a day.
2. Read research papers for at least 30 minutes daily.
3. Publish two papers per year in Tier I and II journals.
4. Submit one grant proposal per year if not already funded.
5. Attend and participate in conferences through the year.
6. Seek additional collaborators.

## Citizenship

### *Self-Assessment*

Serving and being an active member of my department, the university, and the larger research community is another integral aspect to my development as a faculty member at BYU. The mathematics department at BYU has a culture of mutual support and encouragement. I want to continue

to serve and integrate myself into our department so that I can continue this positive culture. This will include serving and participating in both formal and informal departmental assignments. This past year, I helped to develop the exams for the middle and high school state math contest hosted this year by BYU as well as helping to organize a weekly topology seminar.

Another aspect of citizenship is my involvement in the larger mathematical community. As I participate in conferences and referee for scholarly journals, I will define and develop my role in the mathematical community. This past year I refereed for several different journals and organized a conference. As I continue to participate in projects and serve outside of my individual department, I will help to strengthen the mathematical community as a whole.

**Long-term Goals:**

1. Be an active contributing member of the mathematics department.
2. Effectively mentor graduate and undergraduate students (at least 3 annually).

**Plan for next year to work towards long term goals**

1. Find quality speakers to participate in the Focus on Math seminar series for the 2017 Fall semester and the 2018 Winter semester.
2. Coordinate our departments participation in the college Student Research Conference.
3. Assist in the organizing a special year in topology at BYU.
4. Referee for research journals and review articles for Math Reviews.
5. Collaborate with at least two coauthors on projects.

**Signatures**



# Sample 4

# Faculty Development Plan



## BYU Math Department

### Teaching

#### *Self-assessment:*

President Worthen summed up the aims of a BYU education as they apply to teaching in two words: inspiring learning. This is my ideal. As a teacher, I try to inspire learning in two ways, namely, I share my passion about mathematics with my students and I try to be an example of one who learns by study and also by faith.

I came to BYU with several years of experience teaching at previous institutions. My experience teaching consists mostly of calculus classes, but also several undergraduate and precollege classes. Since beginning at BYU, I have expanded my experience to several graduate classes and to mentored research with undergraduate students.

My greatest strengths with regard to teaching are the care I show for my students, a deep knowledge of mathematics, and good teaching strategies. I genuinely care for each of my students, and I try to show it. I learn each of their names (insofar as this is possible), and follow up with them when they are struggling. I make myself available for student consultation in my office hours and otherwise, and I encourage my students to come to my office hours. I come to class early and prepared and I always try to involve my students actively in learning during class time.

I really enjoy teaching, and I think my students can feel my enthusiasm for my subject as I teach them. Because most learning does not happen during lecture, I also spend some time every day trying to motivate my students, and to motivate the material they are expected to learn.

Since coming to BYU, I have a record of high quality teaching. My student evaluations have been exceptionally high---every semester being above and disjoint from the average ranges for the department. I have received a teaching award from the Phi Eta Sigma honor society on campus for Faculty Excellence in Teaching.

Since coming to BYU, I have also already done several things to further improve my teaching. Each course I teach, I give a midcourse evaluation so that my students can provide feedback on ways that I can improve each course. After each class period, I take some time to write down a few notes about any things that did not go well, or things that I would like to change for next time I teach that topic. At the end of each semester, I reflect on each course that I have taught, and I write a summary of the good points of each course, and a few things that I would like to change next time. I have also been in close contact with my teaching consultant in the Center for Teaching and Learning, and I have tried several new strategies in my classroom with some good success.

Finally, I have begun mentoring graduate student, and two undergraduate students.

#### *Goals:*

Although I have very good student ratings, I want to continue to improve my teaching. These goals I have written below will outline some of the ways that I plan to improve my teaching.

1. In every course I teach, I will use writing of some form. I believe that writing well is one of the most important skills that my students can learn.
2. I will obtain a peer review from one of my colleagues in each course I teach, soliciting feedback on things that I can improve.
3. Each year I will read a book about teaching, to get ideas from experts of additional teaching strategies that might be more effective for my students.
4. Each course I teach, I will experiment with one new change that I have designed to improve student learning.

## **Scholarship**

Self-assessment:

In the Math department, there are two separate standards for evaluating research, namely quantity and quality. Regarding quantity, since starting at BYU, I have submitted three articles for publication. On two of these, I did most of the work since I arrived at BYU. In total, I have ten publications, which is considered solid for a mathematician at this stage of my career.

The quality of my publications is good or very good. Three of the publications appeared in Tier 1 journals and most of the rest appeared in Tier 2 journals.

I have already formed a program of research around early success of the work I did in my PhD dissertation, and another project that I worked on while I was a student. These two successes have opened up a research avenue that I anticipate will carry me through at least five years of research.

Another aspect of quality of scholarship concerns recognition of my research. One way to measure this aspect is by giving presentations on my research. This year, I was invited to speak at a conference, and my Master's student will be speaking at a conference in Italy about our joint work. Although this amount of speaking is also good, I would like to increase the number of speaking opportunities I have.

Among the three areas of teaching, scholarship and citizenship, I think scholarship is the area, where I need to focus most of my effort. Part of the difficulty is that scholarship does not have the same kind of deadlines as teaching and service do, so it is easy to push it to the side, while other things clamor for my time. Furthermore, writing is difficult, and the rewards for submitting a well-written article are very slow coming.

One area where I feel a special need to focus, is applying for external funding. I have had no training in grant writing and have only had one opportunity to write one grant proposal so far.

*Goals:*

As mentioned, I will focus much of my effort on improving myself on the area of scholarship. I have set the following goals for myself.

1. I will prepare a research agenda with monthly goals. Each month I will define a product that I will deliver by the end of the month. For example, one month I will submit a paper to a journal for publication; whereas the next month my goal will be to have the introduction for my Grant proposal finished, etc. These monthly goals are minor goals that will advance the major goals of my research agenda. I will also bring samples of my writing each week to my writing group.
2. I will schedule at least one hour of every workday to my research agenda, and I will not allow myself to be distracted from the scheduled time. During my research time, I will allow myself only to work on tasks that further my research agenda. In the summer, I will schedule at least three hours every day for scholarship, and during the Fall and Winter semesters, I will schedule one hour each day.
3. I will have two papers prepared for submission each year. I have the following projects lined up.
  - a. An article on Borcea—Voisin mirror symmetry for Landau—Ginzburg models. This article is nearly finished.
  - b. An article on K3 surfaces with automorphisms of order 4 and mirror symmetry. I hope to have a working draft by the end of the summer.
  - c. An article describing the uniqueness of certain K3 surfaces with an automorphism of order 4.
  - d. An article using Matrix Factorizations to probe for phantoms on the Beauville surface. I have just begun this project. I expect to have it finished by summer of next year.
  - e. An article characterizing the elliptic singularities within FJRW theory.
4. I will submit a grant for external funding each year. In October this year, I will apply for a subject grant from the NSF, and the next year I will apply for the NSF Career Award.
5. I will go to two conferences each year, to meet or renew contact with at least two people at each conference, and I will speak at every opportunity I can find. In this way I will improve my network of collaborators, and increase the number of invitations I receive to give. I will plan to give at least two talks each year.
6. Finally, in order to remain current in the advances in my field of research, I will spend at least two hours each week reading articles that have recently appeared by others in my field.

## **Service**

### *Self-assessment:*

When I started at BYU, I was given some rather large service assignments. The first assignment is to serve as a recruitment specialist, with responsibilities including Math Outreach programs, and recruiting certain high school students to come to BYU and major in math. My other assignment was to serve on the calculus committee. I have since been promoted to be the Course Coordinator for Math 113.

Furthermore, I am serving on two PhD committees and am the chair of one Master's degree committee.

I have also performed service to the community in general and to the greater mathematical community. With Tyler Jarvis, I have organized a conference to take place next summer for young mathematicians in my field. I have refereed three articles, and I have taught Math Circles two times.



Although I certainly made mistakes, I have fulfilled my assignments well. I have made plans to improve my performance in the coming years as well. However, one danger that I can see is that committee assignments will take too much of my time, because I am dependable, I try hard to fulfill all of my assignments well, and I am excited about helping my department, the university, and our students.

*Goals:*

My goals for service I have listed four goals. The first three pertain to service to the department and the university. The last is a goal for service to the general math community.

With respect to the department and university I have the following goals:

1. I will continue to serve faithfully in my department assignments.
2. I will be a congenial member of my department with the goal to get to know every member of my department.
3. I will be a valuable, contributing member of my writing group. Each week I will bring something that I have written during the week for peer review from my group.
4. Serve on a Grant review panel.

## Research Proposal

This research proposal will include a list of products that I plan to produce by the end of February 2018, as well as productivity strategies that I will use to complete these products within the proposed timeline.

- (1) In my faculty development plan, I discussed building upon my earlier successes in research to strengthen my research program. I included a list of projects that I have currently begun, and expect to finish in the next year.
- (2) The products that I wish to complete by February 2018 are the following:
  - a. An article that is currently near completion about Borcea--Voisin mirror symmetry. I expect to have this completed and submitted for publication by the end of June 2017.
  - b. An NSF subject grant. I will apply for a subject grant in the area of Algebra. This grant is due by the end of October 2017.
  - c. I have begun a paper with my Master's student about K3 surfaces with nonsymplectic automorphisms. I plan to have a rough draft of this paper by the end of the summer, and a final draft ready for publication by the end of the year.
  - d. I have begun work on a paper concerning the invariant lattice for K3 surfaces with an automorphism of order 16. I plan to have a rough draft of this article completed by the end of the year.
- (3) In order to achieve these goals, I will use a strategy that I learned in a book called *How to Write a Lot* by Paul Silvia. There he discusses increasing productivity by scheduling time to write, and sticking to the schedule. I will modify his advice to be including specifically setting aside time for scholarship every day. I will schedule at least one hour each day to spend exclusively on my research goals. I learned in that book, that those who sit down and write regularly are more productive by far, than those who write sporadically. I will also schedule two hours each week for reading scholarly articles about research in my field.
- (4) In order to evaluate my success, I will create a table to track my progress, and to track whether I wrote according to my schedule. Each week I will assess myself by the data I have collected on myself each day, and then I will recommit to writing according to my schedule. During the school year, I will also meet regularly with my writing group, and share something that I have written each week.

## **Citizenship Project**

In my faculty development plan, I discussed my department assignments, and the need to not devote too much of my time to service assignments. Some of the goals that I listed there are beyond the scope of the Citizenship Project. Here I will list three separate collaborative goals that I would like to complete by February 2018. I have listed these in order of priority.

1. In the Math Department, we have a writing group that meets weekly to read what each of us has written and to give constructive feedback. In the past I have had a piece of my writing to bring about one third of the time. My first goal for the Fall Semester 2017 is to bring a piece of writing each week to be evaluated by my group. My plan for achieving this goal is related to my research plan. During the summer I will make a list of projects that I will have to write, and I will have something written on each project. Then I will week by week take these written pieces to the meeting of my writing group.
2. Our Department has a gathering each week, called the Soda Social---similar to what has been called Tea Time at other departments. In the past I have often worked straight through these gatherings, either because I was too busy, or because I forgot the appointment. My second goal is to get to know all of the faculty in my department some of whom I do not know very well. My plan for achieving this goal is to attend the Soda Social each week, and to spend my time talking with someone in the department who I usually do not talk with.
3. My third goal concerns moving outside of my department to establish connections with faculty from other departments. I plan to meet four people who I did not know before from other departments before February 2018. My plan for achieving this goal is to attend one event outside of my department each month and speak with someone there, who I did not know prior to the event. Examples of events that I am interested in attending include Lunch and Learn with the Faculty Center and the Writing around the Curriculum workshops.