Professional Development Plan 2016–2020

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Professor

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Section I: Teaching

1. I will request to teach undergraduate courses in Calculus I–II–III, Linear Algebra, Foundations of Mathematics, Abstract Algebra, Real Analysis, and Discrete Mathematics, and graduate courses in Linear Algebra, Abstract Algebra, Complex Analysis, Graph Theory, and Number Theory.

2. The next time I teach Math 641 I will use algebraic number theory as an organizing principle. (The last two times I taught the course I used Galois theory as the organizing principle.)

3. I will continue to write supplementary instructional materials for students and place them on my faculty webpage: course notes, study guides, worked-out examples, and homework and exam solutions.

Section II: Research and Scholarship

1. I will continue my research into proving special cases of the Jacobian conjecture, following up on leads I developed during my Spring 2016 Sabbatical. I plan to give a colloquium talk on my sabbatical research some time in Academic Year 2016–17. Tentative title: *Generating Constant-Symmetry Classes of Binary Catalan Trees by k-Shuffles.* I plan to write a research article along these lines and submit it to The Electronic Journal of Combinatorics.

2. I will continue studying number theory, with an ultimate goal of reading research papers, attending number theory conferences, and identifying suitable research problems to work on. I plan to work through two graduate-level books on number theory, one dealing with algebraic techniques, the other with analytic techniques:

Geometric Modular Forms and Elliptic Curves, Second Edition, by Haruzo Hida, World Scientific Publishing Company, 2011.

Introduction to Analytic and Probabilistic Number Theory (Graduate Studies in Mathematics), Third Edition by Gerald Tenenbaum, American Mathematical Society, 2015.

Section III: Professional Development

1. I will continue my practice of writing extensive lecture notes for each new course I teach, each new textbook that I adopt for a course, and each textbook I work through on my own (for example, the two number theory books listed above).

2. I will develop a new course for the Department of Mathematics and Statistics during a 3-credit release from teaching in Spring 2017: Advanced Mathematical Programming. I plan to incorporate some of the programming techniques I developed during my sabbatical in Spring 2016.

3. At the 2016 Joint Meetings of the American Mathematical Society and the Mathematical Association of America I discussed the possibility of writing a combinatorics textbook with an editor at De Gruyter Publishers. The idea would be to incorporate Mathematica exercises into a first course in enumerative combinatorics. I will have a better idea how to do this once I am finished developing the Advanced Mathematical Programming course.

4. I will continue to attend the annual Joint Meetings for inspiration, research leads, and teaching ideas. I will also attend local meetings of the MAA when I see something that interests me.

Section IV: Contributions to Student Growth and Development

1. I will continue to work with students individually in office hours, write letters of recommendation, supervise individual study projects, serve on thesis and APP committees, and conduct review sessions as the need arises.

2. I will seek ways to involve students in group work. In Math 417/517 this semester (Fall 2016) I have invited students to meet as a group and discuss Masters Comprehensive Exam problems together and to submit solutions for me to comment on.

Section V: Service to the University and Academic Community

1. I will serve on recurring and ad hoc Department committees.

2. I will submit problems for the Master's Comprehensive Exam (linear algebra, real analysis, abstract algebra).

3. I will review research papers and textbooks in my field upon request.