

Brothers, Sheila C

From: Hippisley, Andrew R
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To: Brothers, Sheila C
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This is a recommendation that the University Senate approve the establishment of a new university scholar's program for a: Master's of Sciences / Arts in Mathematics, in the Department of Mathematics within the College of Arts and Sciences.

Andrew Hippisley
Professor and Director of Linguistics
Department of English
1377 Patterson Office Tower
University of Kentucky
Lexington, Kentucky 40506-0027 USA
1-859 257-6989

<http://linguistics.as.uky.edu/users/arhipp2>

Proposal for a University Scholars program for the Master of Science and Master of Arts in Mathematics

Introduction

The Department of Mathematics offers the degrees of Master of Science and Master of Arts as part of our graduate program. These degrees require thirty hours and are available with a thesis or non-thesis option. Approximately ten to fifteen students per year complete the Master's degree and most choose the non-thesis option. The department has an active Ph.D. program and offers the Mathematics major for the Bachelor of Science and Bachelor of Arts degrees in the College of Arts and Sciences. We regularly have our strongest majors enroll in graduate courses while they are undergraduates and these students leave our program with a strong preparation for further graduate study.

The Department proposes to establish a University Scholars program for our Master of Science and Master of Arts program in Mathematics. This will provide a formal path for our undergraduate students to begin graduate study. We expect that most applicants to the University Scholars program will be pursuing option A of the undergraduate Mathematics major. Option A provides students with a stronger preparation in the writing of mathematical proof that is necessary for success in graduate school. Students pursuing option B will be accepted to the University Scholars program if they meet the admission requirements below. As a practical matter, students pursuing option A will find it much easier to meet the admission requirements. This program will help to increase the number of mathematics majors at Kentucky who choose to pursue graduate study and strengthen the preparation of those who choose to go on to graduate study in mathematics. There will be a significant savings of time as students will be able to complete their Master's degree in one year of study past the Bachelor's degree. Students who earn a Master's degree in this program will be well-positioned to continue towards the study of a Ph.D. in Mathematics at Kentucky or other institutions.

Program Structure

A student desiring admission to the Master of Science or Master of Arts University Scholars program in Mathematics is required to meet the following requirements.

1. The student must be an undergraduate pursuing the BA or BS degree with a major in Mathematics and must apply for the University Scholars program in the spring prior to their senior year.
2. The applicant must have 90 hours completed or in progress at the time they apply. The applicant must be on track to complete a Bachelor's degree in Mathematics during the first year of the University Scholars program.
3. The applicant must have an overall grade-point of 3.2 or above on a scale of 4.0 and must have a grade-point average of 3.5 in mathematics (including cross-listed) courses.
4. The applicant must follow the current application procedures for the Graduate School and the Graduate Program in the Department of Mathematics and must meet the admission standards of the Graduate School and Master's program in the Department of Mathematics.
5. At the time of application, the applicant must have two of the core sequences MA 351-352, MA 361-362 and MA 471G-472G completed or in progress.
6. Both option A and option B to the undergraduate Mathematics major require MA 322 and eighteen additional hours at the 300+ level. Applicants must have fifteen of these hours completed or in progress and be prepared to complete the remaining three hours during their first semester in the University Scholars program.

Program of Study

Students who are admitted to the University Scholars program will be able to follow the course of study available to our first-year graduate students. Students may take up to twelve hours that may be counted towards the

Bachelor's and Master's degree requirements. This program does not change any undergraduate degree requirement.

The Director of Graduate Studies or a faculty advisor will advise the students in the University Scholars Program on the graduate program. The student's undergraduate advisor will continue to provide advice on the student's undergraduate program.

Courses available to students in the University Scholars program include:

- MA 514 Combinatorial Structures and Techniques, MA 614 Enumerative Combinatorics
- MA 551 Topology I, MA 651 Topology II
- MA 565 Linear Algebra
- MA 561 Modern Algebra I, MA 661 Modern Algebra II
- MA 537 Numerical Analysis
- MA 522 Matrix Theory and Numerical Linear Algebra I, MA 622 Matrix Theory and Numerical Linear Algebra II
- MA 671 Functions of a Complex Variable I
- MA 575 Introduction to Analysis, MA 676 Analysis I

Students in the University Scholars program will complete up to twelve hours in the first year while finishing their undergraduate program and the remaining hours after completing their undergraduate degree.

Program assessment

The students in the University Scholars program will be following the course of study in our undergraduate major and our Master's program. The effectiveness of these programs is already assessed on a regular basis and we do not plan to do a separate assessment of the academic content of these program for the University Scholars program. To assess the University Scholars program, we will track the number of students admitted to the program and the performance of these students. Successful outcomes will include students who complete the program and obtain both a Bachelor's degree and a Master's degree. We expect some students will enter graduate programs at other

schools after completing the Bachelor's degree and this will also be viewed as a success for the program. We will be interested to see how many students continue on to Ph.D. programs in mathematics at UK and other schools.

The University Scholars program does not require additional courses or faculty, but rather increases the audience for our current offerings. Thus even a small program will be a benefit to the department. We currently have 3 to 4 students per year taking graduate courses while undergraduates. Thus a reasonable target for the University Scholars program is 1 to 2 students per year.

Approved by a vote of the mathematics faculty on 26 February 2013. Updated 31 October 2013 and reviewed by the Chair, the Director of Graduate Studies, and the Graduate Committee

David Leep, Chair, Department of Mathematics

Peter Perry, Director of Graduate Studies, Department of Mathematics

November 25, 2013