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Grant provides students research experience

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Morgan Bell | 0 comments

Valparaiso University recently received a \$279,856 grant from the National Science Foundation (NSF) that will be used to support the university's "Valparaiso Experience in Research by Undergraduate Mathematicians" (VERUM) program. The grant will provide enough funds to continue VERUM for 2013, 2014 and 2015.

"There are probably 40-50 math programs like this all around the country right now, and Valparaiso University is one of them. (The grants from NSF) are really competitive to get. I would say maybe 30 percent of the

applications each year actually get the money," said mathematics professor Lara Pudwell who, along with professor Zsuzsanna Szaniszlo, wrote the application for the grant.

VERUM is a nine-week long summer program that provides undergraduate students from around the country the opportunity to interact in a first research experience in mathematics.

"The goal (of VERUM) is to prepare math majors to think seriously about graduate school and give them some experience with what it is like to do math when you're not in the classroom," Pudwell said.

Nine students are selected to participate in VERUM through an intense application process. Three VU mathematics professors select their team of three students, whom Pudwell says, "have complementary backgrounds," and then mentor and lead the students through a first-time research project.

Professors Alex Capaldi, Hugh Gong and Szaniszlo will be the mentors for the 2013 VERUM projects.

Capaldi and his team will be conducting a project named "Mathematical Modeling in Ecology: What Killed the Mammoth?" This project will focus on researching the cause of extinction by examining recent developments in mathematical ecology.

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"The goal of this project is to follow in the footsteps of the Neanderthal study and consider the similar question as to whether the mammoth's extinction was anthropogenic," said the VERUM webpage.

Gong and his team of students will pilot a project by the name of "Estimating the Volatility in the Black-Scholes Formula by Multiple Approaches."

"The Black-Scholes formula is a tool to forecast an option price. It is simple and has a closed-form solution. However, it has a drawback that assumes a constant volatility of the assets. Usually the volatility of an asset is not deterministic. So my project is to investigate different approaches to estimate this volatility," Gong said.

Szaniszlo will lead a project called "Graph Labelings." Her team will be looking at edge-vertex graphs. According to her online project description, "In the summer project we will investigate when we can distribute labels (numbers) equally in a graph. Answering this question for trees would settle the famous graceful tree conjecture."

Included in the program is free housing for the students in VU's residence halls. They are given \$4,500 for their work and partial reimbursement of travel fees.

Throughout the summer, students travel to different graduate schools and participate in trips to Chicago and the Indiana Dunes Lakeshore. They are also visited by mathematicians and partake in two undergraduate research conferences.

Students are also given the opportunity to attend the Joint Mathematics Meeting the following January where they prepare a presentation of their research and interact with others involved in mathematics. This gives them the chance to show their work to many other people.

Applications for VERUM 2013 are due on Monday, Feb. 25. Requirements for the program include United States citizenship or permanent residency, completion of a proof-based course and undergraduate status for the following school year.

For more information on VERUM, visit VU's Department of Mathematics and Computer Science website.

"Research experience helps (students) get into graduate school. Even if they want a career that's not graduate school, we have people from the program who have gotten jobs from, for example, the government. This experience is an excellent credential to show that they can handle open-ended problems," Pudwell said.

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