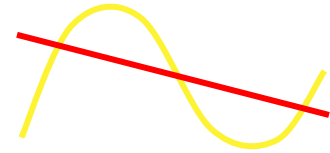


Functions and Lines



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Departmental Events Spring 2006

- February - Modeling Contest (Page 4)
- February - Colloquium speaker (Page 3)
- February - Math and Science program for elementary school girls
- March - Colloquium speaker (Page 3)
- March - Iowa Mathematics Competition
- April - Midwest Undergraduate Mathematics Symposium
- April - Senior Seminar final presentations (Page 3)
- April - Colloquium speaker (Page 3)
- May - Senior Celebration

Dr. Spellerberg Studies Game Theory on Sabbatical

Dr. Rick Spellerberg was on sabbatical during the fall semester of 2005. In July 2005, he attended the 16th Annual International Conference on Game Theory hosted by Stony Brook University. At the conference, Spellerberg met John Nash and Robert Auman, two the Nobel Prize winners.

For the first half of his sabbatical, Dr. Spellerberg concentrated on research which possibly could explain how humans became the dominant species on the planet. He also mentored sophomore Casie Schmitt and junior Jean Clipperton in related research. All three gave talks at the annual meeting of the Iowa Philosophical Association that Simpson College hosted in November 2005.

For the second half of his sabbatical, Spellerberg concentrated on research on Sperm Competition Games. Sperm competition occurs in any setting where multiple males are competing to fertilize the eggs of one female. His talk on this topic for the Biology Department Semi-

nar Speaker Series at Western Illinois University in December was well received. Research in sperm competition will be a major component of an UBM grant proposal for funds to support undergraduate research in Biology and Mathematics at Simpson.



Casie Schmitt, Rick Spellerberg and Jean Clipperton present Game Theory papers to the Iowa Philosophical Association.

Research Opportunities Mixed with Christmas Cheer

The 2005 Carver Science Holiday Party was hosted by the Mathematics Club. Club members decorated the building with several Christmas trees .

Before the party, Dr. Deb Czarneski and Dr. Bill Schellhorn gave a presentation on the how and why of participating in a Research Experience for Un-

dergraduates (REU).

REUs are sponsored by colleges and universities for undergraduates in mathematics and the sciences. Each REU usually runs for 8 weeks in the summer and offers a small group of undergraduates a chance to participate in research. Although each program is different, stu-

dents are usually paid a stipend and receive room and board. Drs. Czarneski and Schellhorn talked about the REUs that are available for Summer 2006, how to apply and why the experience is important.

After the presentation, holiday desserts were served in the atrium.

Piecewise News

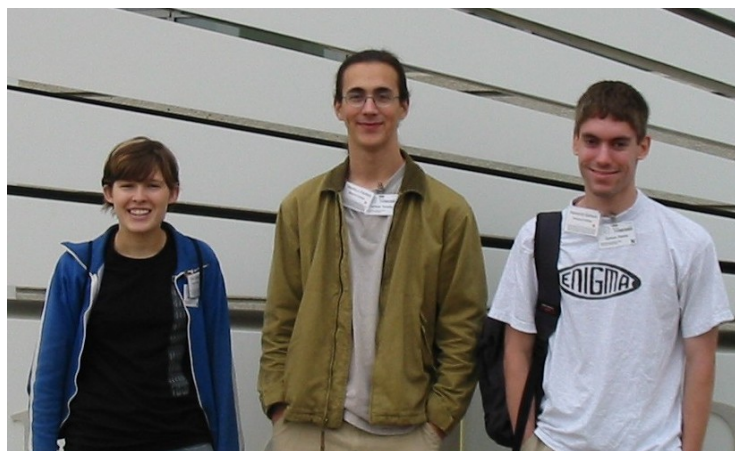
- American Association of University Women and Simpson College sponsor “Math Magic and Science Secrets”, a program for 3rd and 4th grade girls. Mathematics students involved include Jessica Irvin, Becky Faust, Jessica Lashier, Stephanie Zeorlin, Danielle Shelley and Jonna Anderson.
- Dr. Bill Schellhorn is filling in for Dr. Spellerberg’s sabbatical. Dr. Schellhorn has also been hired to teach several courses next year including Mathematical Modeling.
- A group of students will study for the first Actuarial exam during May Term. Ingrid Guttin, an actuary and adjunct teacher, will assist Dr. Spellerberg in preparing the students.
- Dr. Tim Breitzman will give two plenary talks at the Midwest Undergraduate Mathematics Symposium. Dr. Breitzman has a Ph.D. in mathematics from Louisiana State University and works at Dayton University. He will talk on the modeling of cracks in structures such as the space shuttle.
- A Call for Papers has been made for the 3rd Annual Midwest Undergraduate Mathematics Symposium. Any student who has completed independent projects or research in mathematics or related field is invited to make a presentation or to present a poster. The Symposium will be held on Saturday, April 1, in Carver Science Hall.

The laws of probability,
so true in general, so
fallacious in particular.

-Edward Gibbon

- Dr. Murphy Waggoner attended the joint meetings of the American Mathematical Society and the Mathematical Association of America in San Antonio this January. At the meeting, Dr. Waggoner chaired a session on using writing and discussion in mathematics courses which she helped organize.

Students Attend Research Symposium



Tracy Robson, Tim Fairfield and Patrick Carlson visit Argonne National Laboratories for an Undergraduate Research Symposium.

Tracy Robson, Tim Fairfield and Patrick Carlson attended the 16th Annual Argonne Symposium for Undergraduates at the Argonne National Laboratories near Chicago in November 2005.

The two-day symposium featured talks from science, engineering, computer science and mathematics undergraduates reporting on research projects they had participated in during the previous year.

The talks given by mathematics and computer science students included talks on fuzzy logic, database implementation, voter-verifiable election schemes and Hungarian rings. Other sessions included talks in chemistry, biology, physics, genetics, engineering and geophysics.

The symposium included hands-on physics demonstrations, a tour of the advanced photon source and talks by research scientists from the laboratories.

Getting Together to Solve Problems

There are interesting mathematical problems other than those at the end of the chapter in a mathematics book. In order to build skills for solving “nonstandard” problems and to help students prepare for the Putnam Competition, the Mathematics Department sponsored a Problem Solving Seminar last fall.

The Seminar met for 6 weeks and introduced problems in graph theory, series, game theory and other topics. Faculty members gave brief presentations on the specific topic of the day, then students and faculty worked to-

gether to solve problems presented by the faculty.

The conversations were lively as students and faculty talked about possible ways to solve the problems. The types of problems presented were similar to those which have appeared on the Putnam Competition in the past. Two students in the Seminar, Jean Clipperton and Tim Fairfield, competed in the Putnam in December.

In the fall of 2006, two problem solving seminars will be offered: Math 190 A – Problem Solving Seminar and Math 190 B – Modeling Seminar.

Both seminars will last half a semester.

The Problem Solving Seminar will again focus on mathematical problems that are just beyond introductory calculus problems, and the Modeling Seminar will focus on solving “real life” problems such as those in the Mathematical Contest in Modeling. The prerequisite for either class is an interest in mathematics that goes beyond the regular classroom discussion and some calculus background.

Simpson Students Involved in Undergraduate Research

Simpson College mathematics majors complete a research project before graduation. This spring, 10 seniors are working on a variety of projects under the guidance of the mathematics faculty.

Melinda Gatton, Brad Knox and Angela Servais are being advised by Dr. Murphy Waggoner. Melinda is studying dynamical systems, Brad is working on models of heat distribution and Angela is doing research on shapes formed by cut-

ting flat origami.

Amber Woodley, Macy Allen and Mandi White are doing various projects in topology and working with Dr. Bruce Sloan.

Robert Delsing is researching knot theory with Dr. Bill Schellhorn, and Prakash Kayastha is studying graph theory under the direction of Dr. Deb Czarneski. Two students are working with Dr. Spellerberg in game theory: Chase Richardson

and Shikha Basnet. Shikha is actually finishing her second semester of research as part of the Mathematics with Honors degree program.

The students will be making short presentations on the progress of their work later in February. Each will present a poster of their work at the Midwest Undergraduate Mathematics Symposium on April 1. Final presentations of their work will be during the last 2 weeks of April.

“It’s not that I’m so smart,
it’s that I stay with
problems longer”
—Albert Einstein

Math Club Sponsors Speaker Series

The Mathematics Club invited faculty and alumni to give general mathematics talks. The fall speakers were Dr. Rick Spellerberg, who talked about evolutionary game theory, and Dr. Murphy Waggoner, who spoke on applications of chaos theory to the biology of the heart.

The spring speakers will be Dr. Deb Czarneski, Dr. Bill Schellhorn and Nate Iverson, and they will

speak on graphs, knots and the mathematics of juggling, respectively.

Spellerberg, Waggoner, Czarneski and Schellhorn are mathematics faculty at Simpson College. Nate Iverson is a Simpson alumnus and is completing a Ph.D. in mathematics at Bowling Green State University in Ohio.

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Mathematics is the art of
giving the same name to
different things.

--Jules Henri Poincare

www.simpson.edu/math

SIMPSON COLLEGE

The Mathematics program at Simpson is designed to give students an opportunity to develop a mathematical foundation as a tool for understanding the world and society in which they live. The curriculum allows students to develop their problem solving and deductive reasoning skills and enhances their ability to model the present and predict the future status of systems in a changing world.

The department prepares students for either graduate study, careers in secondary education or employment in a mathematically related field. The teaching and learning process incorporates modern technology to assist students in a developing critical analytical skills. Oral and written communication are integrated into the program to help students develop the confidence and poise needed to fully participate in their chosen career.

Students Compete in Modeling Contest

Nine students spent some quality time together on the first weekend of February this year as they competed in the Mathematical Contest in Modeling (MCM).

This annual international competition sponsored by the Consortium for Mathematics and Its Applications gives teams of 3 students the opportunity to spend 96 hours working on a real world problem. Before the weekend is over, the students must solve the problem and submit a paper describing their model and solution.

The competition is an opportunity for students to develop skills such as working in a team, written communication of mathematics, time management and problem solving, all skills valued by prospective employers.

The students competing this year were

- Maya Hristakeva, Shikha Basnet, Max Schlatter,
- Tim Fairfield, Patrick Carlson, Joan Ritho,
- Dillon McKelvey, Prabal Thapa and Joe Edgington.

These students collectively have majors in Economics, Computer Science, Biology, Biochemistry, Philosophy and Mathematics.

Simpson has competed in the MCM since 1997 and has had many teams receive an Honorable Mention or Meritorious designation. The students who have competed find the experience valuable regardless of the final results, and believe the competition

is a great opportunity for putting the knowledge from the classroom to work in a way that will help them prepare for their future careers.



Max Schlatter and Shikha Basnet work to solve a modeling problem about efficient uses of airport resources.