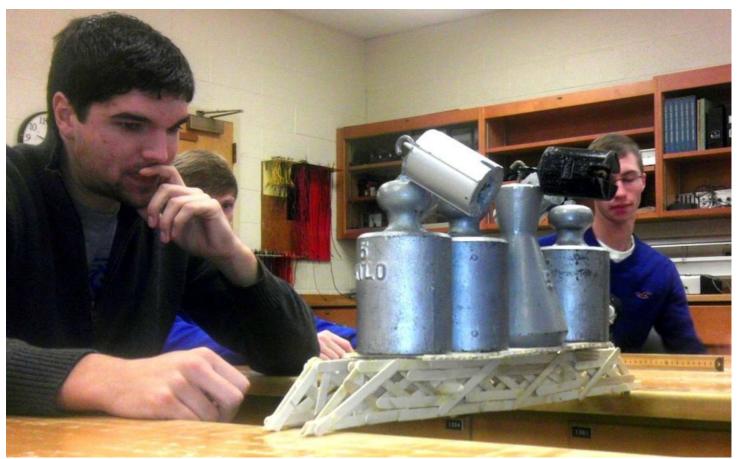# ∫ Integram
EMU Mathematical Sciences Department
Summer 2013

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Introduction to Engineering

Eight students interested in Engineering took the new Introduction to Engineering course in Fall 2012. This new course, developed by **Leah Boyer**, gives an overview of the various engineering fields and professions as well as the core skills required of all engineers. It is designed both for students unsure if they want to go into engineering and also those who have chosen engineering as their major but don't know much about the specific engineering

disciplines.

Course projects included designing and building robots, bridges and solar panels. Mid-semester, the class visited the Catholic University of America Engineering School and attended their Introduction to Engineering class.

One first-year student, Fernando F. Sarmiento Moya, said "Intro to engineering is a very interesting course. We were able to build and design many projects. The class was the perfect size because we were able to get the attention that we might need from the professor."

Congratulations

Scholarship Recipients

Congratulations to **Ryan Swartzentruber** and **Erin Nafziger**, the co-recipients of the Brenneman-Longacher Endowed Mathematics scholarship this year!

A native of Archbold, Ohio, Erin is pursuing a Math major with Secondary Education Licensure, but also considering an English major and a Bible and Religion minor. In her free time Erin enjoys running, playing tennis, crocheting, listening to music, reading, engaging in conversation, and puns. Erin is willing to go wherever God leads her after college: becoming a teacher, accepting a term of service, working in a coffee shop, or becoming an admissions counselor are all possibilities she's considering!

Ryan was born and spent his first three years in Indonesia before his family moved to Pennsylvania. Ryan enjoys outdoor activities – such as mountain biking and hiking – as well as relaxing with friends and playing video games. He is a summer lifeguard at the local pool in Sellersville, and also spent two weeks this past summer on a European tour with the Christopher Dock high school choir. Ryan doesn't know yet what he'll do with his Math major, but he anticipates seeking further education through graduate school after he's done at EMU.

Graduates

We cheered on 14 Mathematical Sciences graduates at EMU's 95th annual commencement ceremony on April 28: **Rasheeda Crews**, **Phillip Jordan**, **Greg Knight**, **Sagar Pandit**, **Ben Roth**, **Aaron Springer** (CS); **Amber Davis**, **John Grove**, **Elias Kehr** (Math); and **Allison Bontrager**, **Stephen Burkholder**, **Janna Kaufman**, **Olivia Nussbaum**, **Andre Swartzentruber** (Math, Secondary Education). Congratulations – and stay in touch!

Faculty

Congratulations to **Dr. Tim Emerick** on the successful defense of his dissertation on the unipotent radical of a group with an RGD system.

Department News

Faculty Changes

Deirdre Smeltzer will be the new Vice President and Undergraduate Dean at EMU. She will also be leading a

cross-cultural group to China in the Fall and plans to continue teaching at least one math course each year.

Physics professor **Leah Boyer** resigned this year. We thank her for nine years of excellent service to EMU.

We enjoyed having **John Wallbaum** and **Tim Emerick** in the department this year.

Originally from Minnesota, Tim has a B.S. in mathematics from Cal Poly San Luis Obispo and an M.S. and a Ph.D. in mathematics from UVa. Tim enjoys hiking, traveling, programming, and teaching and lives in Charlottesville with his wife, Ruth, and their cat, Lightning.

John graduated from Wheaton College in 2005 and completed a PhD from Notre Dame in 2010. His area of study was computability theory, with special interest in free groups. Following completion of his PhD, John taught at Valparaiso University for a semester and then worked for a year with a friend who was growing his small moving company in the Chicagoland area. In his free time, John likes to play almost all sports, but especially basketball and fastpitch softball with his three brothers and his dad. John also enjoys board games and, under the influence of some other members of the department, has been playing a fair amount of bridge since he moved to Harrisonburg!

Finally, we are happy to announce that two new faculty members will join us in Fall 2013. **Dr. Esther Tian** will lead the engineering studies program and the new physics professor will be **Dr. Daniel King**.

Departmental Colloquia

In the fall, **Tim Emerick** gave a departmental colloquium: "How to beat your friends at Connect Four."

In the spring, the department hosted a presentation by **Glenn Wasson** and **Sue Covington**, both from SAIC, titled "How to get creative with your engineering."

CS Activities

The **ACM student club** for computer science students (and anyone else interested in computing) which formed last year was fairly active this year with a competitive election for next year's officers.

Josh Sauder expanded on a class project and published the "EMU App" on Google Play giving easy access to the EMU cafeteria menus from Android phones.

Dee Weikle worked with two students, **Mark Harder** and **Aaron Springer**, on a computer science research project in computer architecture on parallel workload characterization.

Aaron Springer participated in an REU program at UNC Charlotte in Summer 2012 and his group's poster on "Using Sequential Pattern Mining to Increase Graph Comprehension in Intelligent Tutoring System Student Data" was presented at SIGCSE 2013.

Math Activities

The department hosted two **Math Circles** at EMU, one in November and one in January. These were each 2.5 hour problem-solving sessions for middle and high school students to help prepare them for math contests.

Owen Byer and **Deirdre Smeltzer** used their sabbatical and release time to work on a new book. While not quite complete, they plan to have it ready in time to use for the Discrete Mathematics course in the fall semester.

Eight students participated in our third-annual **departmental math competition**, and **Elias Kehr** obtained the

top score (for the third year in a row) and was honored in the Student Recognition Chapel.

Problem Corner

Congratulations go to Jonathan Schinhofen, Greg Sachs, David George, Ellis Detwiler, and Aaron Harder for correctly determining that the answer to the Spring 2011 Integram problem was 11:54. Some readers said they found the answer on the internet, so to discourage that practice, I had my son make up this issue's problem. Good luck!

New Problem:

A woman has three employees. Each is hired at an initial salary of one dollar per day. However, at the beginning of each day, including the first day, she randomly selects one of the employees and doubles his daily salary. What is the probability that the average of the day-12 salaries of the three employees is an integer?

Send your solution to Owen Byer at byer@emu.edu.

> ### *Are you (or do you know) a prospective student who is interested in studying math at EMU?*
>
> Contact Owen Byer at byer@emu.edu for information about applying for the Brenneman-Longacher Endowed Math Scholarship.
>
> Recipients receive $625 per year for four academic years, as long as they continue in the math major.