

# Mathematical Sciences

*“For the things of  
this world cannot be  
made known without  
a knowledge of  
mathematics.”*

-Roger Bacon

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## CS Practicum

Teams of computer science students have been working with Greater Columbus Habitat for Humanity (GCHFH) and Otterbein's Center for Teaching and Learning (CTL) to meet their Programming Practicum requirement. Their practicum projects provide a valuable service to Otterbein and the greater Columbus community.

The Build-It-Again Center is an operation within GCHFH which accepts donated building materials and offers them for sale to the public in their store on Westerville Road. When a donor calls to make a donation, scheduling software developed by last year's practicum class is used to record information about the donor and donation and to schedule a pickup date based on the donor's zip code. The software also prints daily pickup schedules for the drivers as well as donation reports. It has been in use without problem since last June.

This year's class continues to work with GCHFH. The Jobox operation at their Westerville Road facility maintains an inventory of tools that are used by Habitat employees and volunteers to build houses. Tools are checked out for use at building sites and later returned. Students are developing software to support the check-out and check-in of tools using barcode technology and to maintain inventory information in a database. Various reports can be produced.

Another team of students is developing software for the Center for Teaching and Learning to record information about faculty development events and consultations. Information such as who attended the events, what activities occurred, and what materials were developed is entered into a database and can be retrieved by CTL staff in several formats. This allows them to determine trends, provide detailed data for grant requests and reports, and in general operate more effectively.

### Important Dates:

March 31	OCTM Scholarship deadline
April 1-2	MAA meeting at Miami U
April 9	ECC Math Competition
May 6	Distinction Proposals due
May 22	Department picnic
TBA	Panel Discussion--Grad School

## Upcoming Events

The Ohio section of the Mathematical Association of America will hold its spring conference at Miami University on April 1 and 2. All majors are invited to attend. Transportation and lodging will be provided. See Terri Contenza (Towers 134) if you have not yet signed up!

The ECC Mathematics Competition will be held April 9 at West Virginia Wesleyan University. Participants in this year's competition include Allen Cox, Carrie Ebright, Kevin Mugo, Jon Ritts and Youyou Tao. Good luck, teams!

## Grad School Panel

A panel discussion on graduate school opportunities in the mathematical sciences is being planned for the spring quarter. Speakers will include Otterbein alumni who have gone on to pursue graduate degrees. Watch your mail for details!

## Spring Picnic-- May 22

The department's spring picnic will be at 3:00 p.m. on **Sunday, May 22** at Alum Creek Park. All mathematics, computer science, and actuarial science majors are invited to join us for an afternoon of food and fun. Graduating seniors will be recognized and departmental scholarships will be announced.

**Congratulations!!**

Four senior math majors, Julie Carter, Kristi Feasby, Chris Miller, and Danielle Smith, have completed their student teaching. All of them have passed the Praxis exam for teaching licensure. Congrats!!

Otterbein's first actuarial science majors will graduate this spring. Actuarial Science major Youyou Tao and MBA student Henry Ai have passed the first professional actuarial exam. Well done!! Good luck to all our students taking the exam in May.

**Scholarships!!**

The Ohio Council of Teachers of Mathematics will award four \$750 scholarships for students who will be enrolled in teaching certification programs in the fall of 2005. Pick up applications in the Education Department. They must be mailed by **March 31!**

**Volunteer !!**

The Admissions Office needs help recruiting new students. Volunteers speak to area high school students about their experiences at Otterbein. They may also accompany faculty to high schools to give presentations. Thanks to Kevin Mugo, Kellen Murphy, Rachel Goldblatt and John McLaughlin for their help at recruiting events during winter quarter. Students interested in volunteering should talk to Dr. Thompson.

**Graduating Seniors**

As you prepare to leave Otterbein, don't forget to visit our department's webpage ([math.otterbein.edu/dept](http://math.otterbein.edu/dept)) to register as an alumnus. Let us know where you're going, what you'll be doing. And keep in touch—we love to hear from old friends. Enjoy your final ten weeks of college! We wish you well!!

**Problem Corner**

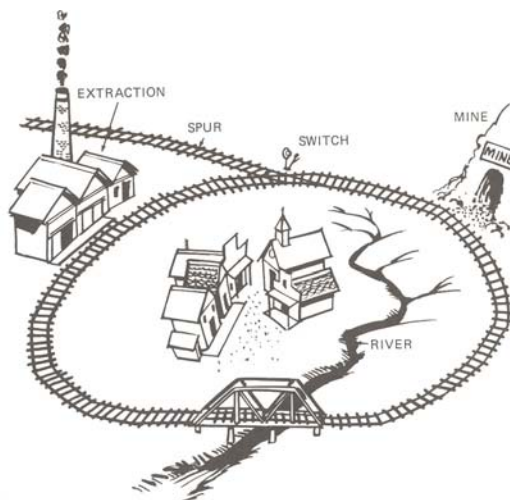
*Submitted by Dave Stucki.*

Once there was a mining town that had a single rail track encircling it. On the east side of the town was the mine. Railroad cars would be loaded with ore at the mine and then travel down out of the hills and across the river to the processing plant on the west side of town. There the ore was crushed and filtered and the mineral extracted. The mineral was loaded back onto the railroad cars and taken to the next city for smelting. There was a spur track from the main rail line that came into the north side of town and connected to the circle track with a Y switch (see figure below).

Each Monday, the railroad would send a diesel engine pulling 100 empty ore cars to the town. It would cross the Y switch onto the circle and head for the mine, where there were another 100 ore cars that had been loaded with ore during the week. The engineer would drop the empty cars at the mine and take the full cars to the plant on the west side of town (a distance of about five miles), where there would be another 100 ore cars that were loaded now with minerals. The engineer would leave the ore to be processed during the week, and pull the mineral train back out onto the spur leaving town.

1. But all this wasn't quite as simple as it sounds. If the engineer pulled the empty train to the mine, then he would have been pushing the ore train to town and would be caught between the empty train and the ore train, and hence would not be able to connect with the mineral train to pull it to the main line. Describe the steps the engineer must take to accomplish his Monday task. (Use E, M, and O to denote the positions of the empty cars, mineral cars, and ore cars at each step of the procedure. Use T to denote the position of the train's engine. )

2. Oh, no!! There was a bad storm one week-end and the railroad bridge at the south end of town was weakened by the resulting flood. The bridge was a half-mile long, and it seemed certain that the bridge could not hold the weight of a whole train at once. It could carry an engine and maybe a few cars, but it would take several weeks to repair it to where it could be used as before. Devise another way for the engineer to rotate the trains on Monday.



The first student to submit a complete and correct solution to both problems will receive a gift certificate to Graeter's Ice Cream. It could be you!!! Submit your solutions to Trish Patterson in the math office.