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Williams College Students Apply Math to Real Life Projects at Mt Greylock

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Eleven students in Professor Steve Miller’s Operational Research Mathematics and Statistics class at Williams College offered creative scheduling help to The Williams Center at Mt Greylock and the Mt Greylock school administration. Using mathematical and statistical algorithms, one group of students (Isaiah Leonard, Ben Hoyle, Vanya Rybkin, Llewellyn Smith, Benno Stein) scheduled student choices for MathBlast, while another group (Katherine Bennett, John Bihn, Alex Flick, Jace Forbes-Cockell and Jose Raventos) proposed new Mt Greylock class scheduling options that could optimize students’ time on learning and academic choices.

On Monday, Dec. 8th, 2014 from 8:30-11:00 am in Bronfman Science Center, the Williams College Department of Mathematics and Statistics held the fifth annual MathBlast, a morning long series of workshops for local 10th graders. These offerings led by Williams math and statistics professors; Colin Adams, Wendy Wang, Stewart Johnson, Mihai Stoiciu, Eyvinder Palsson, and Brianna Heggeseth, expose high school students to real-life math applications. Over 100 students and eight math teachers from Mt Greylock Regional School, BART Charter School, and Buxton School participated. Students chose three workshops from a menu of six offerings that include: Being Bayesian—how could prior knowledge help us?; Gambles, Games, and Group Dynamics; The Golden Ratio and the Fibonacci Sequence; Patterns and Algorithms; Recommendation Systems and Statistics; and Zombies & Calculus: A Survival Guide.
The high school students rank their top workshop choices using an online form; these choices are then sorted electronically into balanced class groups. “In the past this process was all been done by hand, involving multiple people, copies and hours of time. “This year, once the student choices were all submitted, the class lists were generated in less than an hour thanks to the efforts of Professor Miller’s students. It was a fantastic timesaver and so appreciated,” said Kaatje White, Director of the Williams Center at MG. “Our hope is that this simple algorithm and web application can now be applied to other creative education projects, such as Adventures in Learning, where elementary students choose between many workshops.”

Another Williams group has been working with Mt Greylock principal, Mary MacDonald, to explore options for a new class schedule that might allow greater flexibility for students and teachers and enhance time-on-learning. The Williams students’ challenge took into account State mandates regarding length of school day, required classes for graduation, class passing times, class size policies, and size of student body. Using those parameters with a goal of optimizing learning, the Williams students came up with seven class schedule options ranging from rotating block schedules to a trimester system. “A Mt Greylock faculty team evaluates a schedule’s effectiveness every three to four years. The options developed by the Williams students along with the survey analysis they gathered will support the faculty team’s decision making,” said Mary MacDonald.

After getting to know Mt Greylock’s academic program and student interests, the Williams students offered to meet with math students to talk about applications of mathematics and statistics. “The opportunity for students to see their academic work made relevant is always beneficial,” added MacDonald

Operations Research, which was born as a discipline during the tumultuous events of World War II, deals with efficiently finding optimal (or close to optimal) solutions to problems. Professor Miller notes, “In this class we developed a lot of the theory, and then in small teams students saw the issues and challenges in applying it to real world problems. These ranged from data analysis to designing efficient algorithms to dealing with governmental regulations. As a professor it was enormously satisfying to see both how much the students had learned, and how much their projects were able to help. I hope to run the class again in the future, with more collaboration between Williams and our communities”.

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