

PUZZLES, PATTERNS AND PROBABILITIES (Syllabus of Dr. Teresa D. Magnus,* Professor of Mathematics)

James Kelly '08**
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Summary: Students develop mathematical thinking skills as they learn about some of the great theories and applications of mathematics. Students explore, explain, question and define mathematical ideas that have shaped mathematical thinking. Topics include chaos theory, error correcting codes, probability, Fibonacci numbers, infinity and geometry. The only prerequisite to the class is basic algebra.

Required text: *The Heart of Mathematics: An Invitation to Effective Thinking*, 2nd ed., E. Burger and M. Starbird.

In class: Students work in groups to solve mathematical problems based on real world examples, such as how researchers conduct election polls or how insurance companies adjust their rates. Dr. Magnus says that as long as students are open to new ideas and thinking outside the box, they can find solutions to problems that may not necessarily have a formula. This builds a strong foundation of critical and logical thinking skills.

A major portion of the class consists of a group project in which students are instructed to learn about a math topic on their own and present their findings to the class. Dr. Magnus finds this one of the most important aspects to the class. She says, “I want students to build confidence in their ability to learn mathematics independently. I want them to be able to teach their kids one day and not have to be afraid or say ‘I can’t do math.’ This type of self discovery really seems to boost their skills because they realize they can do math. I really enjoy seeing students break their preconceived notions of what they think math is.” ■

* **Dr. TERESA D. MAGNUS** is Professor of Mathematics at Rivier College. She earned Ph.D. (Mathematics) and M.S. (Mathematics) from the University of Virginia, B.A. (Mathematics) from the University of Dallas, and B.A. (Sec. Education) from the University of Dallas. Dr. Magnus specializes in geometry and nonassociative algebra, mathematics of elections, and mathematical preparation of future teachers. She has been a college teacher of mathematics since 1992, teaching courses in abstract and linear algebra, discrete mathematics, problem-solving and modeling, geometry, calculus and precalculus, liberal arts, and developmental mathematics. Dr. Magnus is an advisor of undergraduate research projects in algebraic coding theory, hyperbolic geometry, population modeling, and transformation groups. She contributed to Writing in the Discipline programs at two colleges, developing and conducting courses that satisfied college and departmental writing requirements. She has presented at national mathematics meetings on the effective use of technology in undergraduate mathematics teaching, the discovery method of teaching mathematics, ways to develop proof-writing and general writing skills in students, and designing mathematics courses for liberal arts majors. Dr. Magnus has also coordinated and presented at mathematics workshops for middle school or high school girls.

** **JAMES KELLY** is a 2008 graduate from Rivier College and received his bachelor’s in communication. Upon completion of his degree he began writing on the side for the *Campus Forum* and for the *Rivier Today Magazine*. He is also continuing on with his education and is currently on track to graduate in 2010 with his M.B.A. When not studying, Jim’s hobbies include film, writing, martial arts, and hockey.