Mathematics 1020 Q

" Problem Solving"

Spring Semester - 2013

Instructor: Mr. John Galvin

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Meeting Times: 2:00 P.M. - 3:15 P.M., T -Th , Room 326, Waterbury Campus

Textbook: "PPProblem SSSolving" by Defranco and Vinsonhaler

General Information

Course Description: Ma 1020Q is an introduction to the techniques used by mathematicians to solve problems. This course concentrates on problem-solving strategies involving discrete (non-Calculus) based topics. It is a non-traditional mathematics course appropriate for most non-science majors. Skills such as Externalization (pictures & charts), Visualization (associated mental images), Simplification, Trial & Error, and Lateral Thinking are developed through the study of problems drawn from Combinatorics, Probability, Optimization, Cryptology, and Graph Theory.

Goals: The basic goal of this course is to sharpen problem solving skills that can be applied throughout the college experience and possibly life experiences in general.

Expectations: You should expect your thoughts, during this intersession to be monopolized by **problems** to be solved inside and outside of the classroom**. Attendance and Punctuality** are of the utmost importance; you are responsible for everything that happens in class. It is also expected that you become sincerely **interested** in what you are learning, **enthusiastic** about meeting the challenges of problem solving, and to **delight** in your own improved ability to discover solutions.

Homework & Projects: Homework and Projects (weekly) will be assigned, collected, and graded regularly during the course. Your written work is expected to be neat, accurate, typed, and contain thorough explanations using full sentences and standard English. All calculations must be shown, all details clearly presented.

Grading: The grade that you earn in the course will be determined by your performance on two tests (February and April), the Final Exam , numerous short quizzes (announced and unannounced), homework /classwork, and the Problem Projects.

Calculators: The availability of a **scientific calculator** is strongly advised for use in this course. Your calculator need not be the programmable graphing type (expensive); simply one that can accept and manipulate large quantities (inexpensive).

Supplementary Reading: If you are fascinated by problems and problem-solving, the following books contain interesting and though provoking problems (with and without solutions).

1. "How to Solve It" by G. Polya; Princeton University Press - 1988
2. "Thinking Mathematically" by John Mason with Leone Burton & Kaye Stacey - 1985
3. "A Mathematical Mystery Cruise" by Ivars Peterson: W.H. Freeman & Co. 1990
4. "Logic Made Easy" by Deborah J. Bennett; W.W. Norton & Co. 2004
5. "A Passion for Mathematics" by Clifford A. Pickover, John Wiley & Sons 2005
6. "Coincidences, Chaos, and All That Math Jazz" by Edward Burger & Michael Starbird, 2005
7. "The Colossal Book of Short Puzzles & Problems" by Martin Gardner, Norton & Co. 2006
8. "The Monty Hall Problem" by Jason Rosenhouse, Oxford University Press, 2009
9. "Professor Stewart's Cabinet of Mathematical Curiosities" by Ian Stewart, Perseus Book Group, 2009
10. " Einstein's Riddle", by Jeremy Stangroom, Bloomsbury USA, 2009
11. "Blink" by Malcolm Gladwell, Little, Brown, and Co., 2005