Course Goals: Math 101, Introduction to Problem Solving

Catalog description: An introduction to problem solving and mathematical thinking; the focus of this course is on the process of mathematics rather than specific techniques or content. Students will engage in mathematical problem solving in a variety of contexts and learn a number of broadly applicable problem solving strategies. This course satisfies the M tag General Education requirement. Prerequisites: placement - or - grade of P in MATH 96 - or - grade of PR in Math 96 and concurrent enrollment in Math 99A.

I. Context

Students will demonstrate:

- Knowledge of contexts in which mathematics occurs, and its connections and purposes outside the classroom and in various disciplines. Topics may include applications and roles of mathematics in society, political issues surrounding mathematics, issues of gender, race, and socioeconomics as they relate to mathematics, the *Common Core State Standards for Mathematics*, and mathematics' connections to other disciplines.

II. Process

Students will demonstrate:

- The ability to *explore* non-routine mathematical problems. This may include looking at special cases, drawing pictures, developing patterns, or reframing the problem.
- The ability to *form and test conjectures*.
- The ability to use a variety of standard techniques to *solve problems* including: working backwards, finding patterns, using parity, reasoning deductively, and applying mathematics they know to new situations.
- The ability to *review* their solutions for correctness, subjecting solutions to basic reality checks (does the answer make sense?), or comparing the solution to easy-to-check special cases.
- The ability to *communicate* their solutions effectively, including correct use of mathematical terminology, notation, symbols, and conventions.

III. Content and Quantitative Skills

Students will demonstrate:

- The ability to solve problems from a wide variety of mathematical areas. Topics will include linear and exponential models, proportional reasoning, probability, combinatorics, expected values, and more.
- The ability to mentally estimate solutions to a variety of problems.
- Proficiency in the use of percentages.

Students must pass both of the Math 101 basic skills gateway exams in order to earn a grade of C or higher in the course. One of the exams involves mental estimation techniques and the other involves percentages.

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