

**Nature of Mathematics**  
**Math 102.01, MTR 9-10, PLC 101**

**Syllabus**  
**Spring 2010**

**Course Description**

This is a seminar course devoted to close reading, discussion, and student demonstration of four great ideas in mathematics: geometry, probability, calculus, and logic. There are two goals for this course - for each student to a) acquire introductory content knowledge of these great ideas and b) attain the thinking skills necessary to solve classical problems drawn from each sub-discipline. As a result of engaging with this content and skill acquisition, the student will learn how to think like a mathematician. The objectives required to achieve this goal are as follows: 1) The student will be able to enumerate the primary definitions, postulates and propositions found in each area, 2) The student will be able to describe the fundamental limitations, paradoxes, and contradictions found in each area, and 3) The student will be able to solve classical problems found in each area, both in oral and written form.

**Instructor**

Don Thompson, 310.506.4831, [thompson@pepperdine.edu](mailto:thompson@pepperdine.edu), <http://dt.pepperdine.edu>,  
RAC 132

**Office Hours**

M 1-2, T 1-2, R 1-2, F 9-10

**Reading List**

Euclid. *The Thirteen books of Euclid's elements, Books 1 and 2. (Volume 1)*. Translated by T.L. Heath. 1956. 2<sup>nd</sup> Edition. Dover Publications. Mineola, NY. ISBN 978-0486600888.

K. Devlin. *The unfinished game: Pascal, Fermat, and the seventeenth-century letter that made the world modern*. 2008. Basic Books. NY, NY. ISBN978-0-465-00910-7.

S.P. Thompson & M. Gardner. *Calculus made easy*. 1998. St. Martin's Press. New York, New York. ISBN 978-0312185480.

E. Nagel & J.R. Newman. *Godel's proof*. Revised Edition. 2001. New York University Press. Washington Square. NY, NY. ISBN 978-0-8147-5837-3.

**Demonstrations (25%)**

Mathematics is not a spectator sport. Therefore, every student will be asked to demonstrate mathematics concepts and problems through frequent quizzes and time at the board.

**Attendance**

Our class lives by virtue of you, the students enrolled in, attending, and participating in it. As such, the discussion, inquiry, and demonstration of the concepts in these texts cannot occur fully if you are absent. Accordingly, in addition to the dates listed below when

class will not meet, you have two additional free absences. Once you have missed two classes, your course grade will be lowered by 1% for each subsequent absence.

**Examinations**

Euclid – February 9 (25%)

Probability & Calculus – March 18 (25%)

Calculus & Logic – April 26, 1:30-4:00 (25%)

**Important Dates**

No Class on Jan. 18, Feb. 4, Mar. 1, 2, 4, 25

**Reading, Discussion, & Writing Schedule**

Geometry (12)

Probability (5)

Calculus (16)

Logic (6)

**Getting Started**

For January 11, read the definitions, postulates, and common notions delineated in Book I of <http://aleph0.clarku.edu/~djoyce/java/elements/toc.html> Be prepared to discuss their meaning. These same items are also in the Euclid textbook, on pp. 153-155.