

MATH 293

Honors Seminar in Mathematics

Course Outline

General Description: The primary goal of this class is for the student to begin to acquire techniques to explore the fascinating world of mathematics and its connection to other disciplines, such as art, history, literature, and politics. The course will focus on classroom strategies, including seminar discussions and small group work, which encourage students to creatively engage in mathematical investigations. The student will be expected to take an active role in all parts of the class, including classroom dialogues and presentations. The assignments and activities, both in and out of class, are designed to enhance the understanding, appreciation, and practical experience of bridges connecting mathematics to the world around us.

Learning Objectives: The primary goal of this class is for each student to begin to acquire, enhance, and expand his/her ability to use mathematical thinking skills to explore the intriguing world of mathematics by understanding, interpreting, and solving challenging problems. This course is intended for to provide opportunities to

1. Enhance and expand your understanding, appreciation, and practical experience of mathematics,
2. Engage in scholarly discourse that focuses on expanding awareness of how mathematics relates to our daily lives,
3. Communicate mathematically in both written and oral form,
4. Engage in experiential and collaborative forms of learning mathematics in a project oriented setting,
5. Give and receive encouragement during the challenging experience of mastering the art of learning mathematics, and
6. Provide constructive criticism of fellow student work.

Topics	Number of Weeks
Thinking Mathematically: Introductory Explorations	2
Mathematics and Art: Students will explore the mathematical nature of art. Tessellations, Sculpture, Golden Ratio, Museum Math Walk	2
Mathematics and History: Students will explore the history of infinity including Archimedes quadrature of the parabola, Cantor's theory on infinite sets, and the controversy between mathematicians and the church led by Bishop Berkeley in the times of Newton and Leibniz.	2
Mathematics and Literature: Students will read <u>Flatland</u> as an introduction to the notion of limit and infinity	2
Mathematics and the Grocery Store: Groups as illustrated by bar codes	1
Mathematics and Theatre: Proof, play about cubism	1
Mathematics and Deception: <u>How to Lie with Statistics</u>	2
Final Project Presentations	2

Special Needs: All necessary accommodations will be made for students with disabilities and/or special needs.

Academic Honesty: This course is conducted in accordance with university policy concerning cheating and plagiarism as stated in the Student Code of Conduct. **Cheating or plagiarism in any form is unacceptable. A first instance may result in failure of the course or other serious consequences.** For more detailed information on Towson University Policy please read the following website. <http://www.towson.edu/provost/resources/studentacademic.asp>.

Required Texts:

Flatland by Edwin Abbott, Dover Publications, 1992, Unabridged republication of *Flatland*, first publication Seeley & Co., Ltd., London 1884
How to Lie with Statistics by Darrell Huff, W. W Norton & Company, Inc., 1954, Copyright renewed 1982, Reissue 1993

Suggested Readings:

Fermat's Enigma by Simon Singh
A Beautiful Mind by Sylvia Nasar
The Man Who loved Only Numbers by Paul Hoffman
The Man Who Knew Infinity by Ramanujan
Journey Through Genius by William Dunham
The Code Book, The Evolution of Secrecy from Mary, Queen of Scots to Quantum Cryptography, by Simon Singh
Archimedes What Did He Do Besides Cry Eureka? by Sherman Stein
The Measure of All Things by Ken Alder
Bridges Conference Proceedings – 1999 -2006
The Archimedes Codex by Reviel Netz and William Noel
The Indian Clerk by David Leavitt
Enigma by Robert Harris