Math 107: Explorations in Mathematics
Syllabus, Fall 2007

Professor: **Dr. Jason Parsley**
Office: 334 Manchester Hall
Office hours: M 10-11 am, M 12-1, Tu 2:30-4, F 10-11 am, and by appointment
Online office hour: Tu 10-11pm (through Blackboard)
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1. Course Time & Location: MTWF 9-10, Manchester 020.

2. Texts. (1) Burger & Starbird, *The Heart of Mathematics*, 2nd ed.
  (2) Edwin Abbott, *Flatland*

3. Teaching Assistant. We are fortunate to have Megan McNulty, a graduate student in the math department, as a TA for this course. Ms. McNulty will grade, hold office hour(s), and may lead certain class sessions. Her office is Manchester 359.
    Megan McNulty's office hour: Tu 1:30-2:30

4. Attendance and Participation. Attendance and participation will comprise 10% of your course grade, scored out of 10 points. Daily attendance will be kept. You may miss up to 4 classes without penalty, but every class missed beyond the 4th absence will lower your A & P grade by 1 point. University-excused absences (e.g., varsity athletics, debate team) will not count towards your total of four; all other absences will count. As a math professor, I strongly believe in the utility of of negative numbers; I do therefore allow for the possibility of a negative A & P grade.

5. Front-row seats. To ensure participation for each class meeting, up to 8 students will be selected to sit in the front-row. They are responsible for answering my questions, finding any mistakes, and just generally being on the ball that day. I will rotate through the class roster in a semi-random way when selecting the front-row seat-holders, so that everyone has equal opportunity.

6. Homework. Homework will be assigned weekly. Assignments will be due on Wednesdays, at the start of class. Each assignment is worth 25 points as follows:
  • we will select three problems to grade for correctness, worth 5 points each
  • we award 0-10 points based on how thoroughly you completed the remaining problems

Academic integrity is something I take quite seriously. You are bound to uphold the University Honor Code. For this course, here are my expectations: the assignments that you submit should be your original work. The key ideas for the problems should be yours; if you want to use an idea that is not yours, you must reference how you came to understand it. Having said this, I encourage you to discuss the course material with your classmates, just not the key ideas to a proof. When discussing a problem you understand, try to guide your classmates rather than just telling them the answer (please don't do that!)

7. Quizzes. Most Wednesdays, we will have a quiz at the start of class. Problems for the quiz will be awfully similar to those worked in class and in the homework. Quizzes are worth 10 points each. The lowest quiz grade will be dropped. **No makeup quizzes** will be given, except for University-approved absences and other absences which I approve in advance.

8. Flatland Essay. We will read the mathematical novel *Flatland*, about life in a two-dimensional world during the first half of the semester. You will submit a short essay of 3-5 pages, due on Tuesday, Oct. 15.

9. Extra-credit Opportunities. Throughout the semester, we will encounter extra-credit options. Each one is worth up to 10 points added to your lowest homework score.

10. Tests & Final Exam. There will be two in-class tests and a final exam.

- 1st midterm test: **F., Oct. 5**

- 2nd midterm test: **M., Nov. 19**

- Final Exam: **Tu., Dec. 11, 9am - 12 noon** *note: this is* **NOT** *the math block exam*

11. Grade Calculation:

Homework and Quizzes	30%
Test 1	15%
Test 2	15%
Final Exam	25%
Essay	5%
Attendance & Participation	10%

If you are consistently able to perform basic computations and solve standard problems, you should earn at least a C in the class. If you follow this up with solving harder problems and doing well with exploration problems, you are headed for an A or a B in the class. I will use the following grading scale:

A	90-100
B	75-89
C	65-74
D	50-64

I will use the plus/minus system for grades near these cutoffs. I may adjust this scale in your favor at the end of the semester, but the grading will not be more stringent than what is listed above.

If you have a disability which may require an accomodation for taking this course, please contact the Learning Assistance Center (758 5929), then contact me, within the first 2 weeks of the semester.

Course material: We, loosely, will follow the schedule below; sections refer to *The Heart of Mathematics.* I reserve the right to modify this schedule (e.g., by adding, omitting, or changing the order or timing of topics).

Week of	Topics
8/29	ch. 1 and §4.1 Pythagorean Theorem
9/03	more ch. 1. §4.1, §4.2 Art Museum Theorem, §4.3 Golden Rectangles
9/10	§4.3, §2.2 Fibonacci Numbers. Ellipses, polygons, §4.5 Platonic Solids
9/17	§5.3 Vertices, Edges & Faces, §3.1 Infinity, §3.2 Infinite Sets
9/24	§2.7 on 0.99999 . . . and decimals, §3.3 Cantor & Infinity, §3.4 Power Set & Infinity
10/1	[exam F.] §4.6 Non-Euclidean geometry, §4.7 the 4th Dimension, reading *Flatland*
10/8	§5.1 Topology of surfaces, §5.2 Möbius strips, reading *Flatland*
10/15	[Flatland essay due Tu., don't miss class W., fall break F.] §5.4 Knots & Links
10/22	§6.6 Fractals, Pascal's triangle, §2.3 Number theory
10/29	Number theory, §2.6 Irrational numbers
11/5	Number theory, §8.4 Voting
11/12	Voting, §8.5 Fair division
11/19	[exam M., no class W., F.] Probability
11/26	Probability and counting §7.1-7.4
12/03	Probability, §7.5 Asking Embarrassing Questions, Review