Oakland University
Department of Mathematics and Statistics

Course Summary

Instructions: Course summaries are important for assessment of the Department’s programs as well as for information for subsequent offerings of the course. Please respond to all items relevant to your course. If an item does not pertain to your course, mark the item “not applicable” and do not delete the question. Give a hard copy of your completed form and course materials to Kathy and send her an electronic copy of your completed form.

Course Number and Name: HC 207 An Exploration of the Infinite

Instructor(s): Jerrold Grossman
Semester: Winter 2007


Prerequisites: None
This course is prerequisite for: None

This is a General Education course for Honors College students.

Please attach copies of syllabus, handouts, and exams with median and/or mean scores. Please supply hard copies and electronic copies (if available). If you are the course leader for a multisection course, include course materials for all sections.

Major topics and approximate number of lecture hours for each

Introduction, Michael Starbird video, Powers of Ten video: 1 week
Greek mathematics (Archimedes and pi, Pythagoreans and sqrt(2)): 2 weeks
Sequences and series, continued fractions, fractals, applications: 1 week
Introduction to differential calculus: 1 week
Introduction to integral calculus: 1 week
Cantor’s approach to infinite sets, Schröder–Bernstein Theorem, ordinals, cardinals: 2 weeks
Structures, axioms, Russell’s paradox, mathematical philosophy, etc: 1 week
Gödel’s Completeness and Incompleteness Theorems, Löwenheim–Skolem: 1 week
Measure theory, Cantor set: 1 week
Student book reports: 1 week
Student term paper reports: 2 weeks
Topics which should have been included but were not:

This was a pretty open-ended course. We talked about things as they arose, as students asked about them (or they came up in their presentations), and as I thought of them. Lots of other topics could have been included as well.

Comment on the items below. These items are necessary for assessment of programs in the Department of Mathematics and Statistics, assessment of the University General Education Program, and periodic reviews of the Department’s programs.

**Student Performance**

What is your overall impression of the students’ success in the course? Why do you think that the unsuccessful students in the course had difficulty? (Students’ preparation, amount and/or difficulty of the material, etc.) Comment on the prerequisites. What topics in the course proved to be the most difficult for the students and why? Please share your ideas that might improve students’ performance in the future.

Honors College students are great. They did well on the exams and homework (I assigned a short math exercise in about half the class periods, due the next class). Many of them asked great questions and participated in the discussions. Two students dropped out; the rest all got A’s and B’s. It was a little hard to gear the course at the right level, because some students had a background of about one year of high school algebra, and others were senior math majors at OU.

**Textbook**

Should we change the text? Did the students read the book? Did the students find the book easy or difficult to read? Are the exercises and other items (solutions manual, projects, etc.) good? Do you know of another text that you feel would be better than the text used?

Students thought the book was too dry and academic. I would probably try a different book next time (maybe Eli Maor’s book). The book had no exercises — it wasn’t really a textbook. This was more like a humanities course. I provided a few handouts.

**Technology**

To what extent was technology used? Are you aware of technology that may be useful in this course? Should it be incorporated in the class?

I distributed some Maple handouts showing some calculations I wanted to do, but the students didn’t use any technology.

**Attendance**

Comment on students’ attendance in class.

Quite good. Class participation was a factor in the grade.

**Policy**

In the context of this course, are there aspects of departmental policy for the course that do not seem to be working? Explain. (Number of exams, calculator policy, etc.)
Not applicable.

**General Education Assessment**
If this course satisfies the university general education requirement in the formal reasoning knowledge foundation area (MTH 118, 121, 122, 154, STA 225, 226), please include appropriate assessment items. This includes an analysis of the application and critical thinking problems on the final exam.

This is an Honors College course and as such meets GenEd, but I don’t know anything about formal assessment for it.

**Undergraduate Program Review Guidelines**
Program review bodies identify Problem Solving, Reasoning, Communication (oral and written involving students and instructors, students and students, etc. to further mathematical understanding), and Connections (within mathematics and to other disciplines) as four themes that should be addressed by all mathematics programs. Comment on the manner your course involved these issues.

As one can tell from looking at the exams and syllabus, these were central.

**Graduate Programs**
Please indicate how the course material addressed the graduate program goals that follow and the students performed relative to them.

- (A) Mastery of course material, both theory and application.
- (B) High quality Ph.D. dissertation, scholarly publications and other research endeavors (Ph.D. only).
- (C) Exposure to, and an understanding of, the nature of research in mathematics and statistics.
- (D) An understanding of how mathematics and statistics are used effectively in industry, government, and academia.

This is not a graduate course.

**Other Comments and Recommendations:**

None.