MATH 601: Topics in Algebra (Number Systems)   Spring 2008
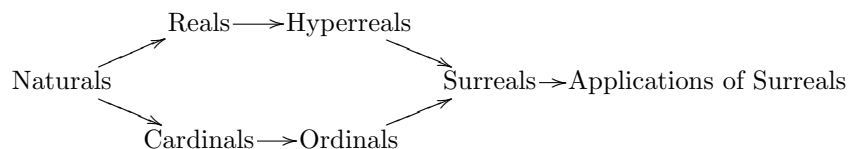MW 4-5:15 GMCS 307
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Office: GMCS 511 4-6176, Office Hours: MW 3-3:50, 5:15-5:40, and by appointment

Overview:
This course will explore several types of number systems. The seven units, organized by containment, are:

There will be no textbook. Instead, handouts will be given periodically with theorems, exercises, and pointers for further study. These are deliberately incomplete; they are meant to guide and supplement work done in class, not to replace it. Students are urged to keep and organize all course materials, including classwork and notes.

Learning Objectives:
The primary course objective is to acquaint students with several mathematically significant number systems, with a wide variety of properties. Students are expected to master basic computation (i.e. arithmetic) and prove some elementary facts about these systems.

The secondary course objective is to endow students with an appreciation for axiomatization and precise argument. Students are expected to apply axioms and definitions repeatedly, rather than rely on intuition or habit. This is aided by the nature of the number systems, which are selected to be unfamiliar.

The tertiary course objective is force students to experience firsthand the challenges of mastering unfamiliar number systems. This objective will not be tested, but will hopefully be achieved along the way.

Attendance:
Students are expected to attend every class. Frequently classes will include interactive or group components, which cannot be adequately replaced. If an absence is unavoidable, students are personally responsible for meeting with a classmate to recover missed material. Excessive absences will negatively affect the course participation grade. No makeup exams are given.

Course Mechanics:
There will be seven exams, held every second Wednesday, as per the following schedule:

Naturals	Reals	Hyperreals	Cardinals	Ordinals	Surreals	Applications	Final Exam
Feb. 6	Feb. 20	Mar. 5	Mar. 19	Apr. 9	Apr. 23	May 7	May 14, 3:30-5:30pm

Exams will last 35 minutes, and will typically have a proof and a calculation. Each exam will count 15% of the course grade. The final exam will count 30% of the course grade. Either the three lowest exam scores, or the lowest exam score and the final exam score, will be dropped from the course average. Class participation will be the remaining 10% of the course grade. All exams are graded from 50 (blank exam) to 100 (perfect).

The grading policy is as follows: A 92-100, B 82-87, C 72-77, D 62-67, ± as obvious

Extra Credit:
On the next class day after an exam (before the exam is returned), students may submit extra credit to improve their grades. They may submit a revised solution to *one* problem. The grade they earn on this revised problem will be averaged with the original grade (rounding down).