Math 189H – University Honor Seminar
TR 9:30–10:45pm
Avery Hall ARR
Fall Semester 2007

Instructor Information:

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Instructor Web Page:	`http://www.math.unl.edu/~jstriuli2`
Office Hours:	Monday and Thursday: 11:00-12:00 and (or) by appointment.

Course Description: Number theory has fascinated both amateurs and mathematicians for the longest time. It deals with the building blocks of the mathematical science, the integers, and it has the most fascinating open questions. The problems about the simplest objects in math can be extremely challenging. Once considered a pure branch of Mathematics, number theory has, nowadays, many applications in modern life: from cryptology, coding theory, to computer science. Shopping on the Internet involves some number theory ideas.

In this class we will investigate properties of the integers. The goal of the class is to have a good experience on how the mathematical investigation goes. By looking at a lot of examples, you will come up with possible properties that the integers have (*conjectures*) and then we will have to prove whether those properties hold true (*theorems*) or we will need to find counterexamples. Along the semester you will learn how to appreciate the investigation in the mathematical science.

Text: At the beginning of each class I will distribute notes summarizing the discussion of the previous class. These notes will be posted on line, usually within the same day of class. You also will need to keep good notes about the class discussions.

Course Grade: Your grade will be based on 3 components: class participation, project, six take-home tests. The total points you receive in this course is based on the following table.

Tests	600	points
Project	200	points
Class participation	200	points
Total	1000	points

Homework: Daily homework problems will be assigned and you will be expected to have prepared them for the next class. I am not going to collect homework but you are expected to present your solution in class when called upon. Collaboration is both allowed and strongly encouraged on the daily homework problems: the best way to learn mathematics is to try to explain what you are trying to do to someone else. Homework are the most important part of this class, you need to them on a regular basis.

Class Participation: Class participation will influence your final grade as described above. Each day I will ask for volunteers or randomly call upon several of you to present to the class your attempts at solutions to homework problems. You are expected to contribute to class discussions and to work with your colleagues.

There are no dumb questions: if you don't understand something I, or somebody else in the class, said, then stop us and ask for explanations. All questions can lead to interesting observations.

Doing mathematics (as learning to play a musical instrument) is learning by making mistakes. We want to establish a class atmosphere where mistakes are an opportunity to learn and get better. Thus, please be constructive and polite in questioning your colleagues.

Tests: There are six take home tests. Three of them will be *collaborative*, in the sense that collaboration is both allowed and encouraged. You will need to write down your own solutions but you will have to reference the people you talked to. The remaining tests will be *solo*. In this type of tests you are supposed to work alone and no collaboration of any kind is allowed. The only person you can talk to about the solo tests is me. I will be very explicit about when you may collaborate and when I expect you to work alone. I will assume you adhere to the UNL Policy on Academic Honesty.

The following is a tentative schedule for the take-home tests:

Given out	*Due date*	*Type*	*Points*
Sep 4	Sep 11	Collaborative	100
Sep 18	Sep 25	Solo	100
Oct 2	Oct 9	Collaborative	100
Oct 16	Oct 23	Solo	100
Oct 30	Nov 6	Collaborative	100
Nov 13	Nov 20	Solo	100
		Total	600

Throughout this course, and in particular in the tests, I am more interested to see what you can do when given the time to think creatively, rather than having you repeat back information. Thus you may find some of the test problems challenging and frustrating at first. Don't be discourage. The goal is to learn how to appreciate the exploring of the unknown; I don't expect you to have perfect solutions.

If a test is turned in late then I will record half of your actual grade.

Class Project: Each student is required to participate to a group project and each group will consist of 2–4 students. The projects will have a written part and an oral part. The last 4 classes or so will be reserved for oral presentations and the group will turn in the written part on the day of the oral presentation. The topic of the project can be chosen from problems we considered in class but were not resolved or from a list of topics I will distribute in early October. Before starting a project the group should communicate its members to me and we should briefly discuss the project topic.

All the members of the group will receive the same grade so it is important that each person in the group participate fully and equally. Attendance during the project presentation is mandatory for each member of the class. If you miss more then one class during project presentations then your grade will be reduced by 1/3 of a letter.

Disclaimer: The instructor reserves the right to modify the content of this sheet. In particular, after class is started, we could find more suitable office hours. It is the student responsability to keep updated with such changes and all the material that will be hand out in class. Note that such changes and all the material will be posted in my web-page.