Math 336, (Honors) Advanced Calculus

Lecture:	MTWF 10:30, MEB 237
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Text:	*Complex Analysis* (required)
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Math 336 is an introduction to complex analysis. I plan to cover the basics: complex numbers, complex functions, analytic and harmonic functions, sequences, series, elementary functions, complex integration, Taylor and Laurent series, residue calculus, harmonic functions, infinite products, gamma function, and zeta function. I hope to give a complete proof of the prime number theorem as the highlight of the course. This proof is a beautiful version of what was once an extremely complicated argument.

As part of the course, I will ask you to write an expository paper on a mathematical topic of your choosing. This paper should read somewhat like a book review. The source material should come from a mathematical journal. During the quarter, I will post links on the 336 website to papers that I think are suitable. I have posted some links on the 334 and 335 website that are also recommended. I will also suggest journals that have articles that can be read by students at your level. If none of the suggestions I make appeal to you, I am open to your own suggestions. The topics need not be related to the material of 334/5/6 (for example combinatorics or number theory might appeal to you). In any case, I want you to discuss your choice with me before proceeding. I'd like you to make this choice before Friday, May 8 and submit a draft paper on Friday, May 22. The final paper will be due on Friday, June 5. This paper will count 10% of your course grade.

Homework will be collected at regular intervals and will count 20% of the course grade. You might find the homework this quarter to be harder than previous quarters. We are starting to function at the senior, early graduate, level now. We will rely on our knowledge of basic results in real analysis. Don't be discouraged if you find them difficult. A quote of Thomas Edison: "I haven't failed. I've just found ten thousand ways that won't work."

There will be two 50-minute midterm tests which will each count 20% of the course grade. The midterm tests will be closed book but you will be allowed to bring notes on one side of a notebook size sheet of paper. There will be a two hour closed book final exam which will count 30% of the course grade. For the final you will be allowed to bring notes on both sides of a notebook size sheet of paper. No calculators will be allowed on tests.

I would like you to read most of chapters I-X, and XIV.
Here are the homework assignments (they may be modified) :

DATE	ASSIGNMENT (from Gamelin)
Apr. 2	I.1: 6, 7; I.2: 6, 7; I.7: 4, 5
Apr. 9	I.8: 7; II.1: 6, 14, 19; II.2: 4, 6
Apr. 16	II.3: 3, 4, 5, 6, 8; II.4: 5, 7, 9; II.5: 2, 4; II.7: 8, 9, 10
Apr. 23	III.1: 6; III.3: 2, 4; III.4:1, 3; III.5: 5, 7, 8
Apr. 27	**MIDTERM**
Apr. 30	IV.1: 4, 8, 9; IV.2: 5; IV.3: 1, 6; IV.4: 2; IV.5: 1, 2, 4
May 7	IV.6: 2; V.2: 7; V.3: 3, 4; V.4: 13, 14
May 14	V.6: 6; V.7: 5, 7, 10; VI.1:5, 7; VI.2: 10, 11, 12
May 18	**MIDTERM**
May 21	VII.1: 3c, 4; VII.2: 5, 8, 9; VII.3: 2; VIII.1: 1, 2
May 28	VIII.2: 1, 3; VIII.3: 1; VIII.4: 2, 6; IX.1: 1, 6
June 4	X.1: 2, 6; X.2: 2; X.3: 1, 6; XIII.3: 3, 4, 6, 7
June 8	term paper
June 8	**FINAL EXAM** (8:30-10:20 a.m.)

Monday, May 25 is a holiday.
These assignments are due at the beginning of class on the due date.