Math 290: Transition to Theoretical Mathematics
Syllabus

LOGISTICS
Instructor: Jonathan Bloom (bloomjs@lafayette.edu)
Course Website: webbox.lafayette.edu/~bloomjs/290
Recommended Book: Elementary Number Theory by Underwood Dudley
The man who loved only numbers by Paul Hoffman

COURSE OVERVIEW
The purpose of this course is to introduce you to theoretical mathematics and prepare you to take more advanced theory based math courses. As such, the emphasis in this course is on reading and writing logical arguments (proofs) instead of on performing calculations and algebraic manipulations.

You should beware that the material covered in this course will look nothing like the mathematics you are accustom. In this course, the mathematics we do more closely resembles an essay from English than an assignment from calculus class! In particular, the proofs we write require complete, grammatically correct, sentences that convey precise logical reasoning.

Finally, you should expect to put significant time into this course and may find the material quite challenging at times. This is normal.

HELP!
In response to this significant transition, lots of help is available. In particular:

<table>
<thead>
<tr>
<th>Instructor</th>
<th>TA (Kaitlyn Lutz)</th>
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</thead>
<tbody>
<tr>
<td>T,Th 2-4</td>
<td>Su 12-1:30; T,Th 7-8:30</td>
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<tr>
<td>221 Pardee (my office)</td>
<td>216 Pardee</td>
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Additionally, you can always meet me by appointment - just email me.

HOMEWORK
Homework in this course is extremely important! Proof writing, like anything new, is learned (and gets easier), through lots of practice. As such it is paramount that you work through all the homework sets and seek help when you have questions. Also:

DO NOT LEAVE HOMEWORK UNTIL THE NIGHT BEFORE!
Homework will be assigned (roughly) every other class. For each assignment, I will grade one or two problems for both logical accuracy and proof writing clarity. In other words, for full credit a complete and thorough explanation of your answer is required. In particular, no credit will be earned for answers that consist of only a number or a string of algebraic calculations without words that support these calculations.

All homework must be written-up using the mathematical typesetting software known as \TeX. (See below for details.)

Although late homework will not be accepted, the lowest homework grade will automatically be dropped.

GRADING

Your final letter grade will be calculated as follows. Homework (due to its importance) constitutes 40% while each of 4 exams contributes 15%. The dates of these exams are

- Midterm #1: Thursday, February 15th
- Midterm #2: Thursday, March 22nd
- Midterm #3: Thursday, April 19th
- Midterm #4: TBA by registrar

The first three exams will be held in the evening from 6pm-10pm on the date indicated. This extra long evening format of exams is designed to remove the time/pressure component of examination. All exams will be held in Pardee 217.

ACADEMIC INTEGRITY

In this course, I strongly encourage you to think through the homework sets with others. That said, you must write up your solutions alone. Any copying of written work from other students, books, or internet sources will be referred to the Dean of Studies for appropriate disciplinary actions (see Student Handbook).

\LaTeX DETAILS

\LaTeX (pronounced “lay-tech”) is a very powerful system for typesetting mathematics. TeX is widely used throughout academia. Almost all mathematicians, computer scientists, physicists, and engineers use this system to present their work. Its usage is also quickly spreading to fields like chemistry and geology.

TeX is not like Microsoft Word or GoogleDocs. These are WYSIWYG environments. Instead, TeX is more like HTML or a “mark-up” language. For example, to obtain the symbol

\[ \int f(x) \, dx \]

one would type: $\int f(x) \, dx$ and then “compile” to create a PDF document.

In this course, we will be using the website www.sharelatex.com to write and compile our TeX code. An evening tutorial session will be scheduled to get you started.
**Special Needs**

If you have any specific learning needs that require special arrangements, please discuss those needs with me during the first week of the semester. To be eligible for special arrangements, you must provide me with the appropriate form from ATTIC.

*The student work in this course is in full compliance with the federal definition of a four credit hour course. Please see the Lafayette College Compliance webpage (https://registrar.lafayette.edu/wp-content/uploads/sites/193/2013/04/Federal-Credit-Hour-Policy-Web-Statement.doc.)*