Course
This course will cover a number of fundamental topics essential for future mathematics courses such as Algebra and Analysis. Among these are basic logic, sets (finite and infinite), the Principal of Induction, functions and relations, congruences, and the complex numbers. Other major objectives are to learn to read mathematics carefully, to appreciate its elegance, to construct correct and complete proofs, and to communicate mathematics clearly and accurately.

Prerequisites
Students must have completed Calculus II (MATH1101, MATH1103, or MATH1105). At least one of the other 2200-level courses (MATH2202 or MATH2210) should either have been completed or be taken simultaneously.

Inquiry Based Learning
There’s no textbook to buy. Inquiry Based Learning (IBL) is a teaching method that replaces lectures with student inquiry and exploration. It is especially suited to courses like this one, in which the focus is on developing a facility with proof based mathematics, rather than learning a list of theorems. Since I will essentially be helping you teach yourselves, class participation will be greatly valued, and weighted accordingly in the grading scheme.

I understand, though, that many students are generally reluctant to participate in class. While I will try to draw out those of you who do not participate of your own accord, I hope that the classroom atmosphere will be friendly enough, and participation will be so common, that eventually all of you will feel comfortable contributing. Participation can be a comment on someone’s proof, or even just something like I didn’t understand that. Can you say it again? Typically, the class should feel more like a group discussion than a lecture, and everyone certainly has the ability to get a 100% participation grade.

So what will a typical day in class be like? You will have been assigned a few exercises to think about beforehand; you should write up solutions to these and bring them. At the beginning of class, some of you will be selected to write your solutions up on the board, taking the class through your arguments. The class is encouraged to ask questions and debate the validity of the argument. During this process, those who aren’t at the board should correct their solutions in red ink. The corrected solutions will be handed in, to be graded on a ‘completed vs. not completed’ scale. After this, I may have people write solutions to other (possibly unwritten) problems on the board, to be again debated. Or we may break into small groups, after which the group work may be presented to the rest of the class.

Although lecture is not an integral part of this course, if it seems expedient to give a mini lecture on something at some point, I may do so. The way that you will learn the material is by working through the problems. For the most part, these will be organized into scripts, sheets of exercises designed to lead you step-by-step through a given topic. You will be able to find these scripts on the course Canvas site.

Exams
There will be two exams given in class:

- Friday, September 29
- Friday, November 3

The comprehensive final exam will be held on Thursday, December 14 @ 12:30 (Section 2) or Friday, December 15 @ 9:00 (Section 1).
**Homework**
Homework will be assigned and collected regularly, roughly on a weekly basis. Submissions must be typeset in \LaTeX. This is a free typesetting language; Mac users may download it at [http://www.tug.org/mactex/](http://www.tug.org/mactex/) and Windows users at [http://tug.org/protext](http://tug.org/protext). I’ll distribute a homework template with the first assignment.

**Credit**

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<tr>
<td>Midterm Exams</td>
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<td>Problem Sets</td>
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<td>Daily Edits</td>
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<td>Class Participation</td>
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<td>Final Exam</td>
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**Office**
My office is Maloney 564, and my regular office hours are M W F 1:30-2:30, T 12:30-1:30. If you have questions or need help and can’t make these times, just see me and we’ll arrange an appointment.

**Comments**

1. Discussion of the homework with others is OK, but what you submit is to be your own work. Anything less is dishonest and a violation of the ethical principles of Boston College, and will receive no credit. I will report any such submission to your Dean.

2. I expect you to maintain the highest standards of academic integrity. Principles and procedures are outlined by the University; visit and read: [http://www.bc.edu/integrity](http://www.bc.edu/integrity). In particular, I will report any violations to your Dean; sanctions will be, at minimum, failure in the course.

3. Makeup exams will not be given unless I am notified in advance by your Dean that for extremely serious reasons you are unable to attend. An exam missed without this notification will be a failure.

4. Class will begin promptly. To avoid disruption, be on time, turn your cell phone off, and have enough foresight that you do not have to leave. In particular, you may not leave the room during an exam. *(Note: if medical issues require an exception, I will of course make one; see me ahead of time.)*

5. I’ll post all materials, including solutions to problem sets and exams, on the course Canvas site. You should have received an email inviting you to the course; follow the link and you’ll be prompted for your BC username and password. You can then see all available sites for any courses you’re taking. After the first time, you can simply go to the BC Canvas portal through Agora.