BOSTON COLLEGE

MATH 2216: Introduction to Abstract Mathematics (3 credits)
Fall 2018

Section 03	MWF	12:00pm	Gasson Hall 309
Section 04	MWF	1:00pm	Gasson Hall 205

Instructor

Patrick Orson
Office: Maloney 541
Office hours: M 3-4, W 2-3, Th 3-4
`patrick.orson@bc.edu`

Course website: The course website is on Canvas (access through Agora).

Course notes: We will closely follow the notes written by Professors Gross and Howard, freely available at `https://www2.bc.edu/patrick-orson/MATH2216_notes.pdf`. Any additional hand-outs, review problems or reading material will appear on the the Canvas page. Please check the page frequently.

Course description: This course will introduce you to the mathematical way of thinking, talking and writing used at the university level (and beyond). The primary goal of this course is to learn how to read and write mathematical proofs. In order to do this we will explore a variety of foundational questions about numbers, algebra and logic. Topics will include: standard methods of proof, binomial theorem, divisibility, Euclid's algorithm, modular arithmetic, elementary set theory, functions, cardinality, and bonus topics (time permitting). Check out the course notes for a more detailed indication of the topics I will try to cover.

Homework: To learn how to write proofs, you need a lot of practice! Each week you will be assigned one piece of written homework, posted on the Canvas course website. Homework should be typeset in LaTeX (see below), printed out, and submitted in class, with multiple pages stapled together. **No late homework or emailed homework will be accepted.** If you know you will have to miss class on a day a homework is due, ask a fellow student to submit it for you on the due day. Contact me in advance if you have to be excused for a homework for some extreme circumstances. **The lowest homework score will be dropped from the overall average.**

Your homework must be typeset using LaTeX.

What's LaTeX? One of the useful take-away skills from this course will be learning to use a word processing system called LaTeX, an absolutely indispensable tool for any scientist or technical writer. Many of your professors for your upper-division math courses will also require you to use LaTeX, so this is the right time to learn. You may struggle to get comfortable with LaTeX at first. Don't panic! I am available to help and it won't take as long as you think to learn it. Once you've used it for a few weeks, you'll love it (no, really).

You need to install some version of the LaTeX package on your computer and learn how to use it:

- Mac users: download MacTeX at `http://www.tug.org/mactex`.
- Windows users: download MiKTeX at `http://miktex.org`.

You might also want to check out different editors:

- Mac users: I like the editor TeXShop, available at `http://pages.uoregon.edu/koch/texshop/`.
- Windows users: the MiKTeX package comes with the TeXworks editor and this editor is totally fine. Some people prefer TeXstudio, available at `https://www.texstudio.org/`.

Many people (including me) learnt LaTeX from *The Not So Short Introduction to LaTeX 2_ε*, available at `http://tobi.oetiker.ch/lshort/lshort.pdf`. The Wikipedia entry for LaTeX has links to many other introductory articles, including an excellent Wikibook at `http://en.wikibooks.org/wiki/LaTeX`. Once you have the basics, a good way to work out new things in LaTeX is simply to stare at other people's source code – I will upload some sample source files to Canvas.

The LaTeX source files for the homework will be uploaded each week on Canvas for you to download and complete. As you prepare your solutions, I suggest that you play it safe by storing a copy on Google Drive (or similar), and also mailing a copy to yourself every time you make any changes. Please make sure you leave enough time each week to TeX your solutions and print them. Especially for the first few homeworks it may take a little while to get it looking as you want it.

Midterms and final exam

- There will be two in-class exams (midterms), held at your usual class time, and one final exam.

Midterm 1	Friday October 05	
Midterm 2	Friday November 09	
Final exam	Section 03	Tuesday December 18, 9.00am
	Section 04	Thursday December 20, 9.00am

- **Grade weighting**

  Participation 5%   Homework 35%   Midterm 1 15%   Midterm 2 15%   Final exam 30%

- **Makeup Exams:** Unexcused absence from an exam will result in a zero score for the exam. If you have a planned, legitimate reason for missing an exam, you must make arrangements with me to take the exam *before* the scheduled time of the exam. **If you are sick the day of the exam, or have a family emergency, etc., go to Health Services or your Dean's office; they will provide me with documentation of your illness or emergency.**

Participation: Throughout the course we will do a lot of group discussion about the proofs you write and the proofs I write – letting others cast a critical eye on your work is by far the best way to improve it. Students will frequently be asked to volunteer solutions to problems in class. At all times it is your job to be supportive and kind to your peers. It is also your job to assess everything you hear critically: Are there enough details? Do you believe the line of reasoning? Is it understandable? Is it logical? This applies even more so to things I say! Don't let me off easy.

Classroom etiquette: In the classroom, please respect the other students by arriving on time. Phones are not to be used during class. Laptops are not to be used during class. If you have any questions at any time, *please* ask me – if you're confused in a class, you can be sure you aren't the only one. Your classmates will be grateful that somebody got me to clarify things.

Academic integrity: I highly encourage you to work together on homeworks and other problems. Working together can be the most efficient and the most fun way to do mathematics. However, **you must write up your solutions by yourself in your own words** (no copy/paste from someone else's work or otherwise copying, transcribing, paraphrasing etc.). Submitting work that is not your own will mean you receive a zero score for that homework. A good rule of thumb: don't turn in solutions you don't understand. Moreover, **cheating on a midterm or final will result in a failing grade for the course**. Violating academic integrity is a serious business – read more about this at `http://www.bc.edu/offices/stserv/academic/integrity.html`.

Special accommodations: If you are a student with a documented disability seeking reasonable accommodations in this course, please contact Kathy Duggan, (617) 552-8093, `dugganka@bc.edu`, at the Connors Family Learning Center (CFLC) regarding learning disabilities and ADHD, or the Disability Services Office (DSO) regarding all other types of disabilities, including temporary disabilities. Advance notice and appropriate documentation are required for accommodations.

Common questions:

- **I'm going to miss a lecture. What should I do?**

  I don't take a register. You don't need to let me know. It is your responsibility to find out what you missed by asking another student.

- **What's up with office hours?**

  Office hours are when I am available to answer questions or to talk about course-related issues. You don't need to make an appointment, you can just turn up. It's not a lecture, so you should come prepared with questions. It can be quite busy at times, so if you've fallen behind it's not the best place to catch up (although it is a good place to talk about a plan to catch up).

- **I want to discuss something confidentially, what should I do?**

  If you need to discuss something private, please email me and we can set up an appointment.

- **What's my grade right now?**

  I can remind you of your numerical scores, but I won't be able to tell you exactly what score you need on the midterms/final/etc. to make X grade.

- **Do you curve?**

  After each midterm, I will announce approximately which numerical scores would hypothetically correspond to an A, B, etc. in that midterm, but individual homeworks/exams are not curved. *There is just one big curve at the end.* Letter grades are assigned only at the end of the course, and according to departmental guidelines to make sure different semesters are comparable. There is also some flexibility since sometimes a class is particularly strong, or the grade distribution is unusual, or I'm aware of exceptional circumstances.

- **I think I lost too many points on my homework/midterm/final. Can you give me some back?**

  I'm always happy to explain mistakes, but unless there was an actual error in grading or totalling I cannot give you more points. One important thing to remember is that all the other papers were graded exactly the same way.