Math 817: Groups and Rings

Intructor: Dr. Katrina Honigs,   khonigs@sfu.ca,   Office SC K 10506

Course info will be listed at www.sfu.ca/∼khonigs/817/

Lecture Time and Location: 12:30-2:20 pm TTh, AQ 5014

Office hours:

Grading: Assignments 60%, Final Exam 40%

Final Exam: In-person, during final exam interval Dec. 6 - Dec. 18. The university will schedule it later in the semester.

Textbooks: "Algebra: Chapter 0" by Paolo Aluffi (Electronic copy available through SFU library) "Linear Representations of Finite Groups" by Jean-Pierre Serre

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Coursework:

- **Homework Assignments**: There will be weekly homework assignments, due at the start of class every couple of weeks. It's not required, but you may wish to take the opportunity to type-set your work in LaTeX. Handwritten assignments are ok, but need to be legible, and they need to not tell me anything is "clear", "obvious", or "easy". I may break these assignments into parts that I'll release separately, and plan to reserve class time for you to work on them collaboratively.

- **Assigned readings**: I will list reading assignments next to the lectures they are associated with on the course website.

Grades: For grad students, a grade of B or lower (for MSc students) or B+ or lower (for PhD students) in a course will result in a meeting with your advisor, because it is considered by SFU to be marginal for qualifying for a graduate fellowhsip, graduating, etc. (Some GPA conversions: B+ is 3.33, A- is a 3.67, A is 4.0, A+ is 4.33)
With that in mind, here are some guidelines on my grading scale: 90% is an A, 70% is an A-, and 50% is a B+.

Accessibility: Students with disabilities who believe they may need class or exam accommodations, including in the current context of remote learning, are encouraged to register with the SFU Centre for Accessible Learning.
If you wish to request religious accommodation, please contact me by the end of the first week of classes.

Prerequisites: There aren't any formal prerequisites, but I do anticipate that you'll have some experience with groups and algebra generally. Everyone has a different background from different programs, so please do ask me if you have questions about what I'm assuming. I'm happy to clarify and provide resources.

Questions: I love questions, especially in lecture. They help make courses better. I often don't have much time to respond to math questions via email in much detail, but I hope there will be many opportunities to ask me in person.

Respectfulness: Courses need everyone's cooperation to be as successful as possible. This is especially true if we're going to do things like take time to work on problems in class together. It's

important to treat each other with kindness and respect as we do this. It's also important to arrive on time and start lecture promptly after breaks. Chronic lateness is very disruptive. If there's a common scheduling issue where you'll have trouble arriving on time (e.g. for grading), let me know and we can do something like starting a few minutes late.

What will we do in this course?

The broad goal of the course is to learn about algebraic structures, highlighting commonalities between methods and instructive examples, ultimately making us all more prepared for whatever algebra we might encounter in the future. Some of the major topics we will work with are: group theory, including for instance the Sylow theorems and solvable groups/composition series, group representations and character theory, as well as projective and injective modules and some homological algebra.

Our main text, Chapter 0, puts some category theory definitions at the beginning and frequently returns to and expands upon these notions. The purpose of this is to highlight commonalities in how we define and work with various algebraic structures. We will beginning the course with chapters 1, 2, and 4 of this text, which are mainly on groups.