

**MATH 521 Sec. 004 TuTh 1 - 2:15,
Room: MSC E406**

Instructor: David Zureick-Brown, W430 Math and Science Center, dzb@mathcs.emory.edu

Office Hours: by appointment

Textbook: “Abstract Algebra”, Dummit and Foote

Website: <http://www.mathcs.emory.edu/~dzb/teaching/521Fall2018/>

Course details: We will cover roughly 1-16 of Dummit and Foote, and some additional topics.

Groups: cosets, Lagrange’s theorem, normal subgroups and quotient groups, three isomorphism theorems, symmetric groups, cycle decomposition and signatures, dihedral groups, group action on sets and proof of Sylow theorems, direct products, automorphism groups and semidirect products, solvable and nilpotent groups p-groups, determination of groups of low orders, groups of order p^2 and p^3 , simple groups.

Rings: Definitions and examples, unit groups, integral domains and their quotient fields, ideals, prime and maximal ideals, PID, Euclidean domains, factorisation in integral domains, UFD, PID’s are UFD, Polynomial ring of a PID is a PID, examples from algebraic numbers and affine curves of UFD and non-UFD’s, Noetherian rings, Hilbert Basis theorem.

Modules: homomorphism of R-modules, direct sums, free modules and the universal property, Noetherian modules and their characterisation, structure theorem for modules over PID, consequences, structure theorem for finitely generated abelian groups and linear algebra (Jordan canonical form).

This class will meet 28 times; there will be 2 exams and a final, and weekly homework (due in my mailbox, on Fridays).

Grade Policy: The midterms are worth 25 percent and the quiz is worth 10. The final exam will be comprehensive and will count for 25 percent. Homework is worth 25 percent.

The midterm dates below are tentative (and may be adjusted), but the date of the final exam is set in stone; make your winter travel plans accordingly. If you have a conflict with the final exam (e.g., another final) please let me know ASAP.

Homework	25%	(Weekly, usually due on Thursday)
Midterm I	25%	(October 4 (Tentative))
Midterm II	25%	(November 8 (Tentative))
Final Exam	25%	(TBA)

Calculators, notes, and textbooks are not allowed in exams or quizzes.

Homework: There will be homework assigned every week, usually on Thursday, due the following Friday, in my mailbox. There will be many simple problems, checking your understanding of the definitions, that will be collected and graded for completeness but not correctness. I will usually grade 3 of the longer problems in full detail. The homework assignments are available at this link, and will be updated after each lecture. . **Please check the webpage for changes before beginning the assignment.**

Honor Code: Remember that copying another student's work is a violation of the Honor Code and will be treated as such.

For homework: you are free to consult any sources (animate or inanimate) while doing your homework (working in groups is encouraged!), but if you use anything (or anyone) other than your class notes or the texts listed above, you should say so on your homework – please state at the end of every problem any sources used.

On the other hand, you are expected to make an honest attempt to do every problem on your own before consulting other sources. Remember that copying another student's work is a violation of the Honor Code and will be treated as such.

A good rule of thumb to avoid plagiarism is the following – when doing the final write up of a problem, do not have any text books, web pages, or classmate's write up in front of you. If you get stuck when writing up an assignment, go back and look again; just make sure that you organize the mathematics in your head before writing a proof rather than copying a solution from some source. **This is a generous homework policy. Please do not abuse it.**