MATH 356-01
Syllabus
Fall, 2018

Instructor:	Dr. Colin Starr	**Office Hours:**	M 8:30-10:00
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Required Text: *Number Theory from an Algebraic Perspective*, by Cam McLeman, Erin McNicholas, and Colin Starr.

Goals: You are already familiar with the basic ideas of Number Theory. In this course, we formalize those ideas and examine some of the deeper principles involved. We will also see some of the powerful modern applications of what has always been considered the purest of pure mathematics. I hope that you will see Number Theory as I do: one of the most beautiful subjects in any discipline, and yet (or perhaps because) readily accessible to anyone who can count. Our approach will be from an abstract algebraic perspective.

The other major goal for this course is independence: I want you to increase your level of self-reliance in mathematics in this course. This means that I will not answer very many questions completely. Instead, I will offer hints or indicate a plausible method of proof. If I think a solution is within your reach, I may send you back without even that (though not very often at the beginning of the term!). This process can be frustrating, but your resulting independence is worth it. Many of you are seniors and/or already have a high level of independence; I will count on you to be models for students who are newer to upper-level mathematics.

Assessment: Your grade will be computed as follows:

Homework:	250 points
Participation:	80 points
Colloquium attendance (3):	20 points
Computer exercises:	150 points
Vocabulary quizzes:	100 points
Midterm Exam:	200 points
Final Exam:	200 points

Grades must fall into the categories below to guarantee the corresponding letter grade.

Letter Grade	A	B	C	D	F
Minimum Percentage	90	80	70	60	

Plus and minus grades are at my discretion but generally correspond to trends in your performance. (E.g., a 90 could be an A or A-.) However, if you focus on learning what we study, the grades will take care of themselves. They should be among the least of your worries; we have much more interesting things to think about!

Homework: Notice that homework is worth a quarter of your grade. It behooves you to be as thorough and careful as possible. Homework will be due each Thursday. Some will take a while to think through, and there will be only enough class time to look at a very few. Solutions to submitted problems must be LaTeXed. Some of the problems will come from your book, and some will come from handouts. Keep alert!

Participation: We will frequently explore new ideas in small groups. Your participation in this is critical! Often, these will be difficult, and we will need to pool resources to solve the problems we come across. Thus, even though I will not take attendance for a grade, I will nevertheless expect you to be here every day. If you must miss, you should let me know in advance.

Computer Exercises: We will take advantage of technology to look for patterns and build our intuition about numbers. We will use SAGE and/or Python to do this. Some computer activities will be in class, and others will be outside of class.

Vocabulary quizzes: We will have a lot of new terminology, so we'll have frequent quizzes to make sure we're on the same page with it. Collectively, these will be worth 100 points.

Midterm exam: We will have one midterm, part in-class and part take-home. The midterm is tentatively scheduled for Thursday, October 11. The take-home part will be a "distributed" exam: each homework

assignment will include one or two well marked problems that are designated as exam problems. You may work together on **homework** problems, but **NOT** on the exam problems. They will be due one week from when they are assigned. (Note that this will often be different from the date you receive the homework assignment.) The in-class part will be short and primarily computational. (We will not take the whole class period on it.)

Final exam: The final will also be part in-class and part take-home following the same model except that the in-class part may contain some proof-based problems.

The final will be on Tuesday, December 11 from 8 to 11 AM. You may not make up any missed exam. If an emergency arises, **contact me prior to the exam.**

Please note: Written responses to all questions must be in complete sentences. I expect correct usage of grammar, spelling, and punctuation at all times; your grade will reflect this!

If you have special needs (e.g., for a documented disability), it is your responsibility to approach me at least a day in advance of the need for accommodation. To receive accommodation, you must be registered with Disability Services; this office is located in Bishop Health Center in Baxter Hall. (Phone: (503) 370-6471.)

Cheating absolutely will not be tolerated. The minimum penalty for cheating is a 0 on the assignment and a formal notification to the dean. I encourage you to work together on your homework, but your final write-up **must** be your own. (I do not expect this to be a problem.)

My door is usually open. The office hours above are the times I will definitely be in my office (or nearby), but you are welcome to come by at other times as well. Make sure you come see me whenever you have a question.