

Mathematics 3510 Syllabus - Fall 2017

Course Description: Introduction to algebraic structures including groups, rings, integral domains, and fields.

Course Objective: By the end of the semester you should be very familiar with the basic concepts, proof techniques, and examples from group theory. You will also know examples of interesting rings, integral domains and fields and have a basic understanding of each. The concepts will be applied to combinatorial and number theory problems as well as problems that arise in other areas.

Prerequisite: Math 3000. Also Math 2700 which may be taken concurrently.

Book: A first Course in Abstract Algebra by John B. Fraleigh (7th Edition)

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M 9-10:30, T 2:00-4:00, W 3:30-4:30, Th 9:00-11:00, F 8:30-10:00 and by appointment.

Please use these hours to ask questions of your instructor. During non-office hours, your instructor will most likely be busy with other responsibilities, so do not just drop in at other times. However, if you need to see your instructor at another time, please make an appointment in advance.

Grading: Grades are based on three regular exams, homework, quizzes, and a final. The homework is worth a total of 100 points, each exam is worth 100 points, the quizzes are worth a total of 100 points, and the final is worth 200 points. This gives you a total of 700 possible points. To earn an A it is sufficient to make a total of 630 points, 560 for a B, 490 for a C, and 420 for a D. You are also required to complete the on-line course evaluation described below.

Course Evaluation: You are required to complete an evaluation of the course sometime during the open period which will occur late in the semester. Your instructor will not receive any information that would link you to your specific answers or comments. The university, the mathematics department, and your instructor take your course evaluation input very seriously.

Homework: Homework will be assigned from the book and handouts. The assignments will be posted on Blackboard. You are expected to turn in neatly written homework. If the grader has trouble reading the homework, then the homework will be returned with a grade of zero.

Exams: The exams will be in class and most likely they will be given on September 27, October 25 and November 29. The final exam for Section 3510.001 is Monday, December 11 at 10:30 – 12:30. The final exam for Section 3510.002 is scheduled for Saturday, December 9 at 10:30-12:30.

Quizzes: Approximately 10 unannounced quizzes will be given throughout the semester. The purpose of the quizzes is to motivate you keep up with the material covered in class as well as the assigned videos

and reading. A quiz will usually consist of one or two questions or exercises based on recently covered or assigned material. Definitions and recently worked out exercises will be typical quiz questions.

Extra Credit: Do not expect to be able to do extra credit work to help your grade either before or after the final exam. There will be no extra credit for this course other than perhaps an extra problem on an exam. Please do not ask for extra credit work to help your grade. Your best bet to help your grade is to do the required work at the time it is assigned. For this class it is particularly important to keep up with what is done in class each day.

Daily Routine: You will be expected to watch videos, read the book or work on exercises each day before class. Activities in class will vary from all lecture and discussion to participating in problem solving exercises. It is better to come to class unprepared than to not attend class, but it will be much more to your advantage to come to class fully prepared and participate actively in the classroom activities.

Cell Phones: The use of cell phones or other electronic devices to text, talk, browse or anything else not directly related to this class is strongly discouraged. (If you need to talk on your phone, go outside the room!) Their use is distracting to the user, other students and the instructor and therefore very inconsiderate and rude. It is essential to pay close attention and focus while in class in order to follow the logic and flow of the lecture and classroom discussion. Furthermore, participation in problem solving activities in class will require your full attention.

Disabilities: The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at <http://www.unt.edu/oda>. You may also contact them by phone at 940.565.4323.

Cheating: No cheating will be tolerated. Cheating includes receiving help from anyone or anything that is not specifically allowed on an exam, final, or quiz. For example, calculators are not allowed on exams and using one would constitute cheating. On the other hand, you are encouraged to work together on the regular homework assignments as long as everyone participates and no one just copies the answers. Anyone caught cheating will receive an F for the course. Furthermore, a letter will be sent to the appropriate dean. I expect no cheating in this class. (See the UNT website on academic dishonesty: <http://www.vpaa.unt.edu/academic-integrity.htm>.)

Last Comment: Anything on this syllabus is subject to change at the discretion of the instructor.

Week of	Monday	Wednesday	Friday
28-Aug	Preliminary Concepts - Section 0	Binary Operations - Section 2	Definition of Groups - Section 4
4-Sep	No Class	Definition of Groups - Section 4	Abelian Groups - Section 1
11-Sep	Nonabelian Groups -Sect. 8 to p. 80	Nonabelian Groups -Sect. 8 to p. 80	Subgroups - Section 5
18-Sep	Cyclic Groups - Section 6	Cyclic Groups - Section 6	Cayley's Theorem - Section 8
25-Sep	Review for Exam 1	Exam 1	Finitely Gen. Abelian Groups - Section 11
2-Oct	Finitely Gen. Abelian Groups - Sect. 11	Cosets - Section 10	Lagrange's Theorem - Section 10
9-Oct	Factor Groups - Section 13	Factor Groups - Section 14	Factor Groups - Section 14
16-Oct	Normal Subgroups - Section 14	Computing Factor Groups - Section 15	Computing Factor Groups - Section 15
23-Oct	Review for Exam 2	Exam 2	Group Actions - Section 16
30-Oct	Group Actions - Section 16	Group Actions - Section 16	Counting - Section 17
6-Nov	Counting - Section 17	Rings and Fields - Section 18	Rings and Fields - Section 18
13-Nov	Integral Domains - Section 19	Integral Domains - Section 19	Fermat's Little Theorem - Section 20
20-Nov	Fermat's Theorem - Section 20	RSA Encryption	No Class
27-Nov	Review for Exam 3	Exam 3	Sylow's Theorems - Section 36
4-Dec	Application of Sylow - Section 37	Review	No Class

Final Exam : Section 001 Monday December 11 10:30

Final Exam : Section 002 Saturday December 9 10:30