



scott m. lewis  
hertz 225  
phone: 963-1803  
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hours:  
2:00pm mtth  
else, by appointment,  
gleefully accepted

#### links:

- [visual group theory](#) - possibly helpful for the visual aspect of group theory.
- [history of mathematics web resources](#)
- [where is your birthday in pi?](#)
- [yoga and meditation techniques](#) - you may need it by the time we're done.
- [history of mathematics archives](#) - see what our friends at st. andrews are up to these days.
- [javaslide](#) - fruit from the tree of worthless information.

## algebraic structures i

math 360  
3 credits  
sam 245  
mwf - 12:00noon

#### text:

(1974). larsen, m. *introduction to algebraic structures*. new york: addison wesley. (cwu coursepack)

#### description:

modern abstract algebra represents a subdiscipline of mathematics with great unifying power. our main topic of study this quarter is known as "group theory," and is essentially the study of symmetry. modern algebra has its origins in classical algebra, geometry, number theory, and analysis, with themes reaching as far back as ancient egypt, mesopotamia, and the islamic world.

there will be three aspects to this course. we first undertake a survey of the history of abstract algebra with a special emphasis on classical algebra and the solution of polynomial equations. the second theme of the course is an introduction to abstraction and will be based on our text. finally, we will study groups, deceptively simple mathematical objects, in two ways: deductively (we will prove stuff about groups, again based on our text) and visually (we will construct diagrams to illustrate the properties of these creatures).

what, you might ask, is a group?

a group can be considered a collection of "*actions*" on a physical object that changes the orientation of the object, but not the actual space it fills. for example, imagine you have a rectangle on a table in front of you with each vertex numbered. you are allowed to rotate the rectangle clockwise 180 degrees so that the rectangle occupies the same space on the table but the numbered vertices are in different locations. you may also flip the square about a line that runs through the midpoints of two opposite sides. there are several such actions that change the orientation of the vertices but not the actual space it occupies. the collection of all such actions that satisfy certain properties is said to form a group. simple, no?

there are some links in the left sidebar of this page. take the time to explore what some people in other universities are interested in. there are other possibly useful links back at my [home page](#).

this quarter we will march as deeply as is reasonable into our text. the first two chapters of our text, supplemented by lectures introducing the the history of group theory, and visualizing groups, will be more than enough for a single quarter, most assuredly reaching into spring.

check out the winter 2010 class calendar.

#### evaluation:

your grade will be determined by **two midterms** (30% ea.) and a **final examination** (40%). the first midterm will take place (and be graded) before the deadline for dropping the class. grades will be assigned on a 90%-80%-70%-60% scale. i do give A-'s, B-'s, and C-'s. occasionally, the lines between A-/B+, etc. are lowered, but **never** raised. in other words, if your average is 90% then you will receive some sort of an 'A.'

i collect selected homework assignments and we will have several unannounced, but straight-forward, quizzes to help you see where you stand regarding the content of the course.

if you have any questions or comments, feel free to come by my office or e-mail me at the address below.

**student learner outcomes**

the most important things you learn in school are not going to be measurable, sorry. in fact, the absolute best service a list of 'student learner outcomes' could possibly provide is as a random sample of behavioral objectives. that said, at the end of this course, you will have a reasonable facility (as measured by the evaluation procedures described above) in describing the nature of groups deductively and visually. along the way you will be able to describe to others what is meant by the following: mappings, equivalence relations, binary operations, groups, subgroups, cosets, normal subgroups, homomorphisms, isomorphisms, and (with a little luck this spring) why any of this could possibly help us decide whether or not polynomial equations may, or may not, have what has been described as a "solution by radicals."

**note**

students with disabilities who wish to set up academic adjustments in this class should give me a copy of their confirmation of eligibility for academic adjustments from the disability support services office so that we can meet in order to discuss how the approved adjustments will be implemented in this class. students with disabilities without this form should contact the disability support services office, bouillon 205 or dssreceipt@cwu.edu or 963-2171 as soon as possible.

**fun with H1N1**

if you have a severe respiratory or influenza-like illness (ILI) (high fever, aches, chills, cough) **you should not come to class until you are without fever for 24 hours without the aid of fever-reducing medication.** if your absences are related to a severe respiratory or flu-like illness, you will be given the opportunity to make up your assignments and class content without penalty. it is your responsibility to notify your instructor *in advance* when absent due to H1N1. faculty is under no obligation to excuse class absences related to sickness. If you are pregnant, work with your instructor to prevent exposure to H1N1. you should utilize the following precautions to prevent H1N1 exposure:

- 1) frequent hand washing and carry a bottle of alcohol-based hand sanitizer with you at all times.**
- 2) cough etiquette (grab your shoulder and cough into your elbow).**
- 3) place used tissues immediately in the trash, followed by washing your hands.**
- 4) use CDC-approved disinfectants on shared surfaces such as doorknobs, desks, etc.**
- 5) Stay home if you have a severe respiratory or flu-like illness.**

If you are concerned you may have H1N1, notify student health. plan for potential absences and assure you have access to the internet and blackboard for assignments. regardless of your H1N1 flu status, you must complete the requirements of the course to receive a passing grade.

**no! no! no!**

no late assignments, no early tests, no late tests, no make-up tests (including finals ... be there).



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| post no bills |

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fall 2018.

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*there's no place like [home](#).*