Algebraic Structures I

Math 360

Online, using Canvas, Asynchronous

3 credits

Scott M. Lewis

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Hours:

I will be available most days all day.

Best by appointment,

gleefully accepted

Texts:

(1974). Larsen, M. Introduction to Algebraic Structures. New York: Addison Wesley. (CWU coursepack)

(2014). Katz, V., and Parshall, K. *Taming the Unknown*. Princeton NJ: Princeton University Press. (Selections)

There are **five major sections** to this course:

- *What is Algebra?* (The activities are posted on Canvas now)
- *Connecting the Dots: "Pre-Modern Algebraic Concepts* (from ancient Egyptian and Arabic roots to Cardano's solution of the cubic)
- *An Example of a Field: Complex Numbers* (From a classic text in Theory of Equations)
- *Foundations of Abstract Algebra: Sets and Logic Revisited* (From our text)
- *Modern Abstract Algebra: Group Theory* (From our text and several outside resources)

The vehicle for accessing the course is Canvas, which you can access via My CWU.

Activities will include, but not be limited to: readings, online lectures, videos, homework assignments, and *Problem Sets at the end of each section of the course*.

THE *PROBLEM SETS* ARE DISTINCT FROM THE HOMEWORK ASSIGNMENTS. You will not be graded on homework or your participation in viewing the online lectures or videos provided (although your chances of passing the course depend on keeping up with these things).

Your evaluation will be based on the five Problem Sets each of which will be keyed to a section mentioned above (you may think of these as take-home exams). Expect about four days to complete these and turn them in electronically.

Submitting Your Work

1) Answer the questions on your own paper.

2) Scan or photograph your answers and ***attach the file as a .pdf*** to an email and send it to me at the email address below.

3) The best way to submit is via email:

slewis@fulbrightmail.org

4) Put the following in the subject line of your email:

algebra set<number> <your lastname +first letter of your first name>

So, my name being Scott Lewis, my subject line for problem set 1 would read like this:

algebra set 1 lewiss

(i'm not worried about capitalization, be creative :)

5) Be careful of file size! There are ways to reduce the files of jpeg's and pdf's.

If the technical part of this is a problem, get back to me and we will work it out.

Remember:
Questions are gleefully accepted!

and

Email is good:
slewis@fulbrightmail.org

What, you might ask, is a group?
Glad you asked. A group can be considered a collection of "actions" on a phycical 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 verticies 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 verticies 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?

But, we have some ground to cover before we get there.

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 poynomial 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 dssrecept@cwu.edu or 963-2171 as soon as possible.

Fun with Influenza
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 illness. you should utilize the following precautions to prevent 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 be ill, notify student health. plan for potential absences and assure you have access to the internet and canvas for assignments.

no! no! no!

no late assignments, no early tests, no late tests, no make-up tests.