algebraic structures i

math 360
3 credits

text:
(1976) herstein, m introduction to algebraic structures: new york: addison
wesley. (our textbook)

description:
modern abstract algebra represents a sub-discipline of mathematics with
great unifying power. our main topic of study this quarter is known as "group theory,"
and in essence 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, deductively 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% each) 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
grade point scale. i do not give a's, b's, and c's. occasionally, the
line between a's and b's, are lowered, but never raised. in other words, if your
average is 90% then you will receive some sort of an a.

you will also be required to keep a notebook that will be collected and
graded on a "pass/fail" basis. in order to receive the grade you have earned on
the exam, you must receive a "pass" on the notebook. a "fail" on your
notebook will result in a grade of "incomplete." your notebook will be single-
subject, looseleaf and have four sections:

- lecture notes (complete, with each lecture dated)
- homework (complete)
- visual examples of finite groups (with Cayley diagrams, multiplication tables,
cycle graphs, hasse diagrams, and objects of symmetry ... huh?)
- handouts and miscellaneous (30a)

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 learning outcomes:
the most important things you learn in school are not going to be measurable,
scoring, or fact. the absolute best course a list of "student learning outcomes" could
be is as follows:

- you should develop a sense of appreciation for the beauty of mathematics
- you should develop a sense of how mathematics can be applied to the real world
- you should develop a sense of how mathematics can be used to solve problems
- you should develop a sense of how mathematics can be used to reason logically
- you should develop a sense of how mathematics can be used to communicate

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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, building 205 or disservices@ccwu.edu or 963-2171 as soon as possible.

fun with H1N1

if you have a severe respiratory or flu-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 absence is 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 ensure 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 late assignments, no early tests, no late tests, no make-up tests (including finals... be there)
winter 2010.

scott.m.lewis, slevish@fulbrightmail.org

there's no place like home.