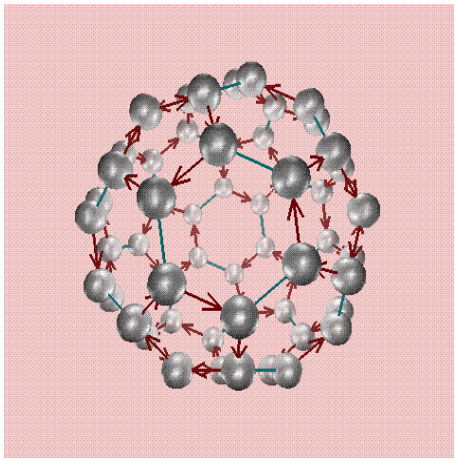

scott m. lewis
sam 218b (maybe :)
phone: 963-1803
fax: 963-3226
hours:
1:00pm tthf
else, by appointment,
gleefully accepted

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.

stuff you should know

working with cayley diagrams - note: this pdf currently contains a non-standard definition of the quaternions taken from *visual group theory* , by nathan carter. to quote the author: "This doesn't matter at all from a group theory standpoint, because the names are irrelevant; you could call them Ed, Cindy, and Joe, and it would be the same group."

S4

algebraic structures ii

math 361
3 credits

sam115
tthf - 2:00pm
text:
(1974). larsen, m. *introduction to algebraic structures*. new york: addison wesley. (cwu coursepack)

description:
a continuation of math 360.
modern abstract algebra represents a subdiscipline of mathematics with great unifying power. we will study more "group theory," this quarter as well as an introductoion to the theory of rings. again, this 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 poynomial equations. the second theme of the course is an introduction to abstraction and will be based on our text. finally, we will study groups, rings, and introduce ourselves to the preliminary concepts of fields, 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 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?

fun with rings i

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 continue our march as deeply as is reasonable into our text. the first three chapters of or text, supplemented by lectures introducing the the history of group theory, and visualizing groups.

check out the winter 2020 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 recieve some sort of an 'A.'

it is suggested, but not required, that you keep a notebook. it should 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*** (tba)

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 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.

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

| post no bills |

winter 2020.
scott m. lewis, slewis@fulbrightmail.org
there's no place like home.