

TMATH 402
UH 12:50-2:55pm JOY 105
Lecturer: Ruth Vanderpool
Office Hours: UH 10:15-11:45am
@TLC Snoqualmie 2nd floor

Winter 2014
SLN: 20905
Office: MDS 303C
Phone: 253-692-4310

e-mail: rvanderp@uw.edu
<http://faculty.washington.edu/rvanderp/>

Course Description: This is a proof based course on group theory with an introduction to rings and fields. Topics include: cosets, Lagrange's theorem, homomorphisms, normal subgroups, quotient groups, the isomorphism theorems, cyclic and symmetric groups, Cauchy's theorem, automorphisms, and elementary properties of rings and fields. Prerequisite: 2.0 in TMATH 300s.

Learning Objectives: By the end of the course students should be able to:

1. define and identify groups, rings, and fields, both abstractly and in applications,
2. derive and prove elementary results about groups,
3. identify and arrange all subgroups of basic groups into a lattice ordered by containment,
4. build a well-defined homomorphism and identify its kernel,
5. use the Isomorphism Theorems to prove results about groups,
6. apply abstract algebra to a science, educational, or engineering project of their choosing.

Required Items:

- Text: *Contemporary Abstract Algebra* by Joseph Gallian. 5th Edition
ISBN: 0-618-12214-1

Important Dates:

2/4	Midterm	1/10	Last day to alter your schedule with no fees
3/15	Final (12:50-2:55)	2/21	Last day to change grading option

Grades:

The following weights will be used to calculate your percentage in the course. The function f takes your percentage in the course and returns your grade on a 4. scale.

Reading Quizzes	10%
Project	20%
Assignments	25%
Midterm	20%
Final	25%

$$f(x) = \begin{cases} 4.0 & \text{if } 90 < x \\ .1x - 5 & \text{if } 57 \leq x \leq 90 \\ 0 & \text{if } x < 57 \end{cases}$$

Final grades will be assigned in accordance with the UW Tacoma grading system for undergraduate students found at scale posted at: <http://www.tacoma.uw.edu/current-students/grading-policies>.

Reading Quizzes: 10%

Assigned readings are posted on the detailed schedule online and must be completed before the day they are listed. By reading the material beforehand the class will be able to entertain more complicated topics that are both more interesting and better practice for the homework and project.

Regular reading quizzes will be made available on Canvas and are due by noon *before* any lecture on the same material is given. You may work with others when completing your quizzes but you must cite who you worked with. No make up quizzes will be given unless previously scheduled, but I will drop the lowest quiz to give you some flexibility.

Assignments Policy: 25%

This course emphasizes proofs and prose writing instead of the usual numerical computations. Generally the homework assignments will contain more words than calculations and are intended to help you internalize the definitions and concepts covered in the course. Each homework assignment will need to be composed and *edited* before a final draft can be turned in. This means the homework will require a lot more time than the assignments in previous math courses (each should take between 4-6 hours).

Homework will be assigned regularly at the beginning of class and the previous week's material is due Tuesday by 4pm with 20 minutes set aside on Thursdays to answer homework questions. If completed early, you may turn these in to the Homework folder on Tuesday at the end of class, otherwise slide your *stapled* assignment under my office door in MDS 303C by 4pm on Tuesday. No late homework will be accepted.

A reflection on your writing will be assigned in week seven and must be uploaded into the TMath 402 Module in the Canvas MathPortfolio page by week ten. In this assignment you identify one proof written for the class and:

1. Rewrite the proof correctly and completely typing your final version,
2. Write a brief reflection (100-300 words) describing how you choose the proof you did and highlight any dramatic changes you made in your rewrite.

The second item will count as one homework assignment ($\approx 3\%$) and the first item's grade will replace your lowest scoring homework.

Outside Resources:

Come visit me if you have questions! If you are unable to attend my posted office hours but would like to meet, please let me know. I am willing to try and work with your schedule. Also remember that you are not alone in this class and your peers are a valuable (and often underutilized) resource.

The Teaching & Learning Center can offer a number of additional instructional services. Additionally math tutors are available Monday through Thursday from 10am to 6pm. Complete information and updates are available at:

<http://www.tacoma.uw.edu/teaching-learning-center/teaching-learning-center>.

Notes:

- I do *not* check my email after 4pm. Any questions sent to my email after 4pm may not receive a response until the next morning. The University's e-mail policy is posted at: http://www.tacoma.washington.edu/policies_procedures/E-mail_Policy.pdf
- There will be no tolerance for cheating. If caught, any and all disciplinary action will be pursued. All exams are to be done individually unless otherwise specified. You are encouraged, however, to work together on the homework and form study groups outside of class.
- The University of Washington Tacoma is committed to making physical facilities and instructional programs accessible to students with disabilities. Disability Support Services (DSS), located in MAT 354, functions as the focal point for coordination of services for students with disabilities. If you have a physical, emotional, or mental disability that "substantially limits one or more major life activities [including walking, seeing, hearing, speaking, breathing, learning and working]," and will require accommodation in this class, please contact DSS at (253) 692-4508, email at dssuwt@uw.edu, uwtshaw@uw.edu or visit <http://www.tacoma.uw.edu/dss> for assistance.
- While I have attempted to make this syllabus as complete as possible, adjustments will be made throughout the course. Announcements will be made during class and it is the responsibility of the student to keep updated if class is missed.
- The Counseling Center offers short-term, problem-focused counseling to UW Tacoma students who may feel overwhelmed by the responsibilities of college, work, family, and relationships. Counselors are available to help students cope with stresses and personal issues that may interfere with their ability to perform in school. The service is provided confidentially and without additional charge to currently enrolled undergraduate and graduate students. To schedule an appointment, please call 253-692-4522, email uwtshaw@uw.edu, or stop by the Student Counseling Center (SCC), located in MAT 354. Additional information can also be found by visiting <http://www.tacoma.uw.edu/counseling>.
- Complete safety information and emergency procedures is available at <http://www.tacoma.washington.edu/security>.

The highlights are as follows:

- In case of fire, take your valuables, leave the building, and report to the parking lot between Joy and Dougan. Plan to return to class once the alarm has stopped.
- In case of an earthquake, DROP, COVER, and HOLD. Once the shaking stops, take your valuables, leave the building, and report to the parking lot between Joy and Dougan. Do not plan to return for the rest of the day.

In both of the above cases, do not return until you have received an all clear from somebody "official," the web, or email.

- Safety escorts are available 24 hours a day, 7 days a week, there is no time limit. Call the main office line at 253-692-4416.

Tentative Schedule

Week 1	Introduction to Groups Class canceled	Chapter 1
Week 2	Properties of \mathbb{Z} and \mathbb{Z}_n Equivalence Relations & Definition of a Group	Chapter 0 Chapter 0 & 2
Week 3	Properties of Groups Terminology & Subgroups	Chapter 2 Chapter 3
Week 4	Cyclic Groups NSA back door to NIST	Chapter 4
Week 5	Catch up/Review Midterm	
Week 6	Rings Fields	Chapter 12 Chapter 13
Week 7	Permutation Groups Isomorphisms	Chapter 5 Chapter 6
Week 8	Cosets & Lagrange's Theorem Normal Subgroups & Factor Groups	Chapter 7 Chapter 8
Week 9	Factor Groups continued First Isomorphism Theorem	Chapter 8 Chapter 10
Week 10	Catch up/Review Posters	