

**MATH 462 – Abstract Algebra II**  
**Dr. Boersma**  
**Winter 2023**

**Goals:** This course is a continuation of Abstract Algebra I. Picking up where we left off last quarter, we will begin by studying rings and fields, paying special attention on polynomial rings. We will explore the various structures of extension fields, splitting fields, and finite fields. In terms of the textbook, we will work through the following sections:

- Chapter 16: 16.1 – 16.4 (*finish on or about January 20*)
- Chapter 17: 17.1 – 17.3 (*finish on or about February 3*)
- Chapter 18: 18.1
- Chapter 21: 21.1 – 21.3 (*finish on or about March 3*)
- (if time) Chapter 22: 22.1
- (if time) Chapter 23: 2.1

It is important to understand that this is a senior-level, abstract mathematics course. Unlike some of your previous mathematics classes, like calculus and differential equations, there is not much focus on computation and “getting the right answer”. Instead we care more about the detailed study of certain examples and the ability to abstract those properties which appear fundamental to the overall structure into well-worded definitions. From these definitions we will be able to build up our knowledge base in the form of theorems. Reading, understanding, and creating proofs of theorems is essential to an understanding of abstract algebra. The ability to communicate mathematics and mathematical truths will be the most essential skill needed for success in this course. Pay attention to detail – when reading the textbook and when turning in your own work.

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**Required**

**Text** *Abstract Algebra: Theory and Applications*, by Thomas W. Judson. You may view this online or download a free pdf copy. Printed copies are available for purchase. See <http://abstract.pugetsound.edu/> for more information.

**Collected**

**Homework** Three homework sets are given below and should be completed and turned in as we cover the material. When you hand in a homework set, I will be looking for neat, clear, and concise solutions containing complete and eloquent explanations. You should think of these turn-in homework sets as an opportunity for you to really show me your understanding of the material. All homework should be typed in  $\text{T}_{\text{E}}\text{X}$  or  $\text{L}_{\text{A}}\text{T}_{\text{E}}\text{X}$ . Each will be assigned a grade of “Excellent (E)”, “Pretty Good (P)”, or “Not Yet (NY)”.

You may revise and resubmit homework assignments once per week. The last day to submit any homework is March 15.

- HW Set 1: From Chapter 16: 1, 2, 3, 7, 11
- HW Set 2: From Chapter 17: 16, 18, 19, 24, and 7a from Chapter 18
- HW Set 3: From Chapter 21: 1c, 2a,c,h, 10, 13

**Your Grade:** Your final grade in the course is determined by the following table. Each grade has a requirement specified in its row in the table. **To earn a grade, you will need to meet the requirements in the row for that grade.** A grade of F will be given if **none** of the rows have been fully completed.

<b>Grade</b>	<b>Homework</b>
A	3 at E
B	1 at E and 2 at P
C	3 at P
D	1 at P

**Plus/minus grades** will be assigned at my discretion based on how close you are to the next higher grade level.