

Math 641-01 Abstract Algebra  
Mon-Tue-Thu 2:00 – 2:50 PM  
Classroom: Wissink Hall 286  
My Office: Wissink Hall 263

Professor: Dan Singer  
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Office Hours: 9-10, 12-2, 3-5 Mon-Tue-Thu

**Course Description:** A rigorous excursion through some of the topics of abstract algebra which are essential components of the background of a masters level graduate student.

**Prerequisite:** Math 345.

**Textbook:** *Introduction to the Galois Correspondence, Second Edition*, Maureen H. Fenrick, Birkhäuser, 1998.

**Course Format:** We will study Galois theory this semester with an ultimate goal of proving three outstanding theorems in the realm of abstract algebra: (1) The field of complex numbers is algebraically closed, (2) Polynomials of degree 5 and greater are not necessarily solvable by radicals, (3) Certain geometric constructions, such as duplicating the cube, squaring the circle, and trisecting an angle, are not possible using only ruler and compass. Along the way we will develop the theory of groups, permutations, fields, and polynomials. My plan is to work through all the material up to page 172 of the textbook, which averages out to 4 pages a material each class meeting. A schedule is provided on the second page of this syllabus. Please familiarize yourself with the material ahead of schedule so that we can make the most of our class time. I will assign as homework all problems not thoroughly worked out in class. There will be four take-home exams. Students are encouraged to study together and ask questions in class and in office hours, but all homework and exam solutions are to be the work of each student working individually.

**Attendance Policy:** Please attend regularly. I would appreciate it if you would send me an email in advance of any unavoidable absences or emergencies.

**Academic Integrity:** You are welcome to consult the internet or other textbooks for background material, but you must never copy a solution from these sources and claim it as your own.

**Grade Calculation:** Exams are worth a total of 40% of your grade. Homework is worth a total of 60% of your grade. Each assignment receives points on a 0 — 100 scale. I award grades on a straight scale: 90-100% is an A, 80-89% is a B, etc.

**Grade Policy:** Your grade is based on your performance during the 16 weeks of the semester in accordance with the grade calculation above. I will not change any grades after they have been submitted to the Registrar, and I will not consent to extra-credit opportunities designed for the express purpose of raising the grade of one individual. All discussions with me regarding your grade should be limited to how you can study adequately for exams and what scores I have currently recorded for you in my records. Consult the handout “Five Tips for Effective Studying in Mathematics Courses” at the beginning of the semester for advice on studying.

**Class Schedule:**

Week 1, August 27, 29, 30: pp. 1 – 12	
Week 2, September 4, 6: pp. 13 –20	
Week 3, September 10, 11, 13: pp. 21 – 32	Exam 1 distributed
Week 4, September 17, 18, 20: pp. 33 – 44	Exam 1 due
Week 5, September 24, 25, 27: pp. 45 – 56	
Week 6, October 1, 2, 4: pp. 57 – 68	
Week 7, October 8, 9, 11: pp. 69 – 80	Exam 2 distributed
Week 8, October 15, 16, 18: pp. 81 – 92	Exam 2 due
Week 9, October 22, 23, 25: pp. 93 – 104	
Week 10, October 28, 29, November 1: pp. 105 – 116	
Week 11, November 5, 6, 8: PP. 117 – 128	Exam 3 distributed
Week 12, November 12, 13, 15: pp. 129 – 140	Exam 3 due
Week 13, November 19, 20: pp. 141 – 148	
Week 14, November 26, 27, 29: pp. 149 – 160	
Week 15, December 3, 4, 6: pp. 161 – 172	Exam 4 distributed
Finals Week, December 10 – 14	Exam 4 due