POLICIES/SYLLABUS

Instructor: Eric Moorhouse, moorhous@uwyo.edu, Ross Hall 63 = 216, phone 766-4394

Class Meets: MWF 9:00am – 9:50am, CR 209

Prerequisite: Grade of C or better in Math 3500 (Algebra I: Introduction to Rings and Proofs). Successful completion of Math 4510 (Algebra II: Group Theory) is an asset, but not essential; please let me know as soon as possible if you have not completed Math 4510. Familiarity with linear algebra (at the Math 2250 level) will be expected; please let me know if this is a problem.

Office Hours: MW 10-10:50am and R2:10-3:30pm in RH216. In addition to my regularly scheduled office hours, please feel free to see me at other times, either by appointment or at other times if I am not busy. My current schedule is posted at http://www.uwyo.edu/moorhouse/schedule.html

Suggested References (not required): The course content is standard and may be found in several dozen currently available undergraduate-level textbooks. Three reasonable references which have been successfully used in our program are listed here.


You may well stick with whatever textbook you have been using up to now for Math 3500/4510, if it works for you. Printed handouts (also available on the course website;
see below) will be prepared and distributed as the course progresses, so no particular textbook will be required.

**Grading Scheme:**

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<tr>
<th>Percentage</th>
<th>Component</th>
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<tr>
<td>10%</td>
<td>Participation</td>
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<tr>
<td>40%</td>
<td>Homework</td>
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<tr>
<td>20%</td>
<td>Midterm Test</td>
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<td>30%</td>
<td>Final Exam</td>
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I will assign grades (A, A-, B+, B, B-, C+, C, D, F, W) *at the end of the semester* according to the scale: A=exceptional, B=very good, C=adequate, D=poor, F=fail, W=withdrawal. I always encourage students to consult me at any time during the semester with questions, including (but not restricted to) questions about your progress in the course. You may ask questions by email, at your own risk (remember that email is not secure); but questions asked in person typically receive more prompt and complete answers.

**Participation:**

The participation component of the grade will be based on your regular attendance timely arrival for class sessions, in addition to participation during class, including asking and answering questions and evident engagement in class activity.

**Homework:**

Homework is the most vital part of this course. Mathematics, more than most subjects, is one which you learn not by listening and absorbing, but by trying out yourself. The learning of mathematics is also more sequential than that of other subjects … so all the more need to be regular in doing problems yourself! Homework assignments will be assigned approximately once per week, and will be submitted to me on the specified due date (usually after 2–3 classes), at the end of class. The following expectations apply to submitted homework:

- Multiple pages should be *stapled* together.
- Write clearly. Part of the grade reflects organization and clarity of presentation. Tablet paper is better than pages ripped from spiral-bound notebooks (I will trim off the if I see it). The back side of printed paper (e.g. from a recycling bin) is fine.
Many solutions require sentence answers, e.g. in answer to ‘Explain’ or ‘Why…’ questions. In such cases, correct use of vocabulary, spelling, grammar, and punctuation is expected for full credit.

If you must submit homework outside of class time, either slide it under my office door, or ask the Math Department secretary to put it in my mailbox. Never leave ungraded homework outside my door, as this is insecure.

Always remember to put your name, the class (Math 4520), and the assignment number (e.g. HW1, HW2, etc.). There is no need to re-write questions.

It is fine for you to discuss the homework with other students. However, please do not copy anyone else's work directly. Copying may adversely affect your grade; but more importantly, of course, you won't be adequately preparing yourself for the tests in this way.

**Tests:**

We will have one 75-minute test during class time, and one final exam. Both are ‘closed book’; however, you will be permitted to use a handheld calculator and one ‘cheat sheet’ (one 8½×11 inch sheet with information written on one side in your own handwriting). Sharing of calculators or other aids during the test and the exam is not permitted. No other devices are permitted. Cell phones must be switched off (and in particular cannot be used as calculators). The test will each cover a specified unit of material only, but the final exam will be comprehensive. A tentative date for the midterm test is Wednesday, October 18. The final exam is scheduled for 8:00–10:00am on Friday, December 15, 2017, in our usual lecture room (CR 209).

Make-up tests for those who miss tests, will only be granted in cases of verifiable illness or the most extreme circumstances (at my discretion). Please contact me in advance of such a situation if possible, or leave a message with the Math Department (766-4221). Even in legitimate cases, the make-up test will be harder than the original test.

**MATH 4520 Website:**

Course-related announcements, links, homework assignments and solutions, and handouts will be posted at [http://www.uwyo.edu/moorhouse/courses/4520/](http://www.uwyo.edu/moorhouse/courses/4520/). The electronic copies offer several advantages over hardcopies distributed in class: full color format, electronic search capability, and updated versions in which any reported errors have been corrected.
The Algebra Depth Sequence (Math 3500/4510/4520):

The Algebra Depth Sequence at the University of Wyoming consists of three courses: Math 3500 (Algebra I: Introduction to Rings and Proofs), Math 4510 (Algebra II: Introduction to Groups), and Math 4520 (Algebra III: Topics in Abstract Algebra). These courses cover (roughly) the theory of rings, groups and fields, respectively—three of the four classes of algebraic structures which form the cornerstone of modern algebra. The fourth such class of structures (vector spaces) is the subject matter of Math 2250 (Elementary Linear Algebra). The student is assumed to arrive at this point (the third course in the sequence) with a ready foundation in formal mathematical thinking and communication, including the reading and writing of proofs, as well as a strong foundation in the theory of rings, and vector spaces.

Course Content:

We plan to cover the basic theory of fields, including

- The most important examples ($\mathbb{R}, \mathbb{C}, \mathbb{Q}, F_q, \mathbb{Q}_p, F(x)$), algebraic number fields, the hyperreals, etc.) and the most basic properties of each.
- Basic theory, beginning from the axioms of field theory: field extensions, characteristic; algebraic and transcendental elements; splitting fields; field automorphisms; algebraic closures.
- The impossibility of trisecting an arbitrary angle in the Euclidean plane using straightedge and compass.
- The rudiments of Galois theory, including Abel’s Theorem: the impossibility of expressing roots of a general quintic polynomial $f(x) \in \mathbb{Q}[x]$ as algebraic expressions (including radicals) of the coefficients of $f(x)$. (Only general results will be presented, not complete proofs.)

Students with Disabilities: If you have a physical, learning or psychological disability and require accommodations, please let me know as soon as possible. You will need to register with, and provide documentation of your disability, to the University Disability Support Services (UDSS) in SEO, Knight Hall 330, phone 766-6189.

Appropriate Conduct: For issues of academic honesty/dishonesty, classroom deportment, etc., we refer to

- UW Student Code of Conduct (UW Dean of Students)
- Students & Teachers Working Together (UW College of Arts & Sciences)

Links to both documents appear on our course website.