

# MATH 3613 INFORMATION (CRN 64500/64502)

MWF 9:30AM–10:20AM, Fall, 2017, in MSCS 514

**Instructor:** David Wright, MS 527, 744-5775, FAX: 744-8275

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Online Classroom (D2L): [online.okstate.edu](http://online.okstate.edu) (Main location of class resources)

**Office hours:** MWF 1:30–3:00PM at MS 527 and at other times by appointment.

You can always email questions, call on the phone or knock on the door at any other time. If I am not occupied with something else, I will be happy to help you.

**Text:** *Abstract Algebra: An Introduction*, 3rd ed., by Thomas W. Hungerford.

**Prerequisites:** Linear Algebra as covered in MATH 3013. This gives familiarity with advanced examples of an abstract algebraic structure, namely, matrix algebra.

**Course objective:** A rigorous treatment of the basic patterns and structures of operations that occur throughout mathematics and its applications.

**Methodology:** We will first review the basics of rigorous thinking: mathematical statements: axioms, definitions, propositions, lemmas, theorems and corollaries, rules of logical deduction, and abstract set theory. Then we will rigorously develop the algebraic structure of the ring  $\mathbb{Z}$  of integers. A ring is an algebraic system in which there are operations of “addition,” “subtraction,” and “multiplication” that obey the customary rules (“commutative”, “associative”, and “distributive”). We study next the ring  $\mathbb{Z}_n$  of integers modulo a positive integer  $n$ . Then we will explore the abstract concept of ring. Then we return to the special case of the ring of polynomials. After that, we will present more of the abstract theory of rings. The course will then introduce the concept of “group”, which has only a single operation (which can be “addition”, or “multiplication, or something more abstract). After a basic introduction to groups, we may end course with the basics of “algebraic coding theory,” which has been of great importance computer design and operation, security systems, and other applications of discrete mathematics.

Writing all the logical steps in calculations and proofs will be important to success in this course.

**Syllabus:** See the course calendar which has a tentative schedule for the pages of the textbook we should be reading for a given class. All students read these pages carefully. Everything in the reading is considered fair game for tests and assignments.

**EXAMINATIONS:** Two exams will be given in class, on **Wednesday, Sept. 27** and **Wednesday, Nov. 1**. **THERE WILL BE NO MAKEUP EXAMS**; students with very serious documented conflicts must warn me well in advance (more than three days) of the exams, and we will work out some alternative arrangement. There is also a scheduled final exam on **Monday, Dec. 11, 8:00–9:50AM** (*Ugh*).

Cellphones must be completely turned off and stored during exams.

Calculators up to the level of a TI89 will be permitted on exams, but they are likely to be more of a distraction than a help, since the emphasis will be on written verbal problem solving and creation of proofs.

You will be given an exam with the questions and space below for you to write out the solutions and the work needed to justify them. Unless otherwise stated, all the logical steps needed to justify your work must be written in reasonably grammatical and brief sentences on the exam paper or on blank paper that will be provided.

**Assignments:** There will be a mixture of outside assignments, outside online quizzes, outside and in-class group work. The emphasis will be on individual written homework assignments. Due dates will be announced in class at least a week in advance.

**Grading:** The two in-class exams will be 100 points each, and the final exam will be worth 150 points. Assignments and quizzes will be worth at least 150 points. If your score is greater than 150, the excess will count as bonus. The course total is graded out of 500 points.

Students who achieve at least 90%, 80%, 70%, or 60%, respectively, of 700 will be guaranteed of receiving at least an A, B, C, or D, respectively. Depending on the median scores, these cutoffs may be lowered. Some discretion of the instructor may be used in deciding borderline cases.

**STANDARD OPERATING PROCEDURE:** All students must complete a minimum of two to three hours of work per class outside attending lectures. This work is to consist of reading in detail all sections of the book covered in class and performing all assigned homework problems and enough additional problems to make sure that you understand the material. It is very important that you complete this outside class work on a regular and steady basis.

**Academic Dishonesty:** Academic dishonesty or misconduct is neither condoned nor tolerated at OSU. Academic dishonesty is behavior in which deliberately fraudulent misrepresentation is employed in an attempt to gain undeserved intellectual credit, either for oneself or another. Academic misconduct is behavior that results in intellectual advantage obtained by violating specific directions, rules, or accepted academic standards, but without deliberate intent or use of fraudulent means.

**Attendance Policy:** All students are responsible for all material covered in class and all announcements made in class. Notes and other course material will be available at [online.okstate.edu](http://online.okstate.edu). Attendance is not taken, but we strongly advise that students who attend regularly generally perform much better in the course.

**Disability:** If you feel that you have a disability and need special accommodations to pursue the course, the instructor and the Office of Student Disability Services will work with you to ensure that you have a fair opportunity to complete this class. Please advise the instructor of such disability before the second class period of the second week of the term.