

INSTRUCTOR: *Alfred Menezes*
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Office hours: Monday 3:00-5:00 pm, Wednesday 1:00-3:00 pm

TEACHING ASSISTANT: *Koray Karabina*
Office: MC 6232
Office hours: Tuesday 2:00-3:00 pm

COURSE WEB PAGE: www.cacr.math.uwaterloo.ca/~ajmenezes/co331/

This page will include office hours, course handouts (including assignments and solutions), and brief summaries of lectures.

TEXT: We will closely follow the book *An Introduction to Error Correcting Codes with Applications*, by S.A. Vanstone and P.C. van Oorschot. The book is available for about \$120.00 from the bookstore. Copies of the book are also available on 3-hour reserve at the Davis Centre library and at the St. Jerome's library. The book is a good source of additional worked examples and exercises (the exercises are available on the course web site).

PREREQUISITES: Math 135 and Math 235.

COURSE OUTLINE: We will cover some algebraic methods for devising error-correcting codes. These codes are used, for example, in satellite broadcasts, CD players, and memory chips. The mathematical ingredients for the course include linear algebra, groups, rings, ideals, and finite fields. The necessary abstract algebra will be introduced as needed.

The following topics from the text will be covered (roughly in this order):

- Chapter 1 (Introduction and Fundamentals)
- Sections 2.1–2.5 (Finite Fields)
- Sections 3.1–3.6 (Linear codes)
- Section 4.3 (The binary Golay code)
- Sections 5.1–5.8 (Cyclic codes)
- Sections 6.1, 6.2, 6.4 (BCH codes)
- Time permitting: Section 7.1–7.5 (Reed-Solomon codes, erasures, interleaving)

EVALUATION

Assignments (4):	20%
Quiz (Feb 10, in class):	10%
Test (Mar 10, 7-9 pm):	20%
Final exam:	50%

POLICIES

- **Class etiquette.** Out of courtesy to your classmates, please refrain from talking during class. (This policy will be strictly enforced.) If you have any questions about the lecture, you can ask me during class or during my office hours.
- **Class etiquette.** Out of courtesy to your classmates, please arrive to class on time and please do not leave class until I have finished lecturing. (Exceptions for emergency situations are permitted, of course!)
- **Office hours.** Whenever possible, please see the Teaching Assistant for any questions you have on assignment problems, or for other routine questions. I prefer that my office hours be used to answer conceptual questions or questions about the course material.
- **Email queries.** Please restrict your email queries to questions that have short (e.g., YES/NO) answers. Questions that may have longer answers are best handled in person during office hours.
- **Collaboration on assignments.** You are welcome to collaborate on assignments with your colleagues. However, *solutions must be written up by yourself*. If you do collaborate, please acknowledge your collaborators in the write-up for each problem. *If you obtain a solution with help from a book, paper, solutions from previous offerings of the course, web site, or elsewhere, please acknowledge your source.*
- **Assignment deadlines.** Late assignments will *not* be accepted except in very special circumstances (usually a documented medical condition). High workloads because of midterms and assignments in other courses will *not* qualify as a special circumstance.
- **Attendance.** While attendance is not mandatory, you are responsible for the material covered in any classes you may miss.

ASSIGNMENTS AND TESTS SCHEDULE

January 11, Monday	Assignment #1 out
January 20, Wednesday	Assignment #1 due
January 20, Wednesday	Assignment #2 out
February 3, Wednesday	Assignment #2 due
February 10, Wednesday	QUIZ (in class)
February 12, Friday	Assignment #3 out
March 3, Wednesday	Assignment #3 due
March 10, Wednesday	TEST (7:00-9:00 pm)
March 15, Monday	Assignment #4 out
March 31, Wednesday	Assignment #4 due
March 31, Wednesday	Assignment #5 out (not to be handed in)