Mathematics 342, Section 201
Algebra, Coding theory and Cryptography
Term 2, 2026. TTh 3:30 - 4:50pm
in West Mall Swing Space Building (SWNG), room 221

Instructor: Zinovy Reichstein

Course description: Math 342 is an introduction to abstract algebra and error-correcting codes. Both proof and algorithmic techniques will be emphasized. Topics will include coding and decoding schemes, coding bounds, perfect codes, finite fields, linear codes, syndrome decoding, Hamming codes and cyclic codes.

Registration: I am not authorized to register students into my classes. If you have any questions or concerns about registering for this class, please contact the Mathematics Department.

Homework: I will assign four problem sets during the term. My plan is not to collect your solutions but rather give a short quiz in class, based on one or two of the assigned homework problems, and mark those instead. Preliminary dates of the quizzes are Thursday, January 29 (week 4), Thursday, February 12 (week 6), Thursday, March 11 (week 9) and Thursday, April 2 (week 12). I will drop the lowest of the four homework scores.

Group work: I will hold four group work sessions during the term. Each time I will divide the class into groups at random. You can discuss the problems with other students in your group, you are also welcome to ask me questions. Marks will be assigned to individual students (not groups). Preliminary dates for group work sessions are Thursday, January 15 (week 2), Tuesday, February 3 (week 5), Thursday, March 5 (week 8), and Thursday, April 9 (week 13). I will drop the lowest of the four quiz scores.

Midterm Exam: There will be two in-class midterms, Thursday, February 26 (week 7) and Tuesday, March 24 (week 11).

Final Exam: The final exam will take place some time during the final exam period. The specific time and place are set by UBC's central administration; they are usually announced some time in the middle of the term. Students who are unable to take the final exam at the scheduled time (e.g., for health reasons) should apply for deferred standing (SD) status through their faculty. I do not have the authority to change the timing of the final exam or to grant the SD status.

Lecture notes: I plan to post lecture notes of Canvas after each lecture.

Attendance: The entire course is in person, we will only move to zoom in exceptional circumstances (e.g., a snow storm).

You are expected to attend the lectures. If you miss one occasionally, you can catch up by reading the lecture notes. Don't make a habit of missing class though. You will need to be present in class for the homework quizzes, group work sessions and the midterms. It will not be possible to make up for those at an alternate time or on line.

Marking scheme: I will compute the total term mark for each student in two ways,

Total 1 := HW (10%) + GW (10%) + Mid 1 (20%) + Mid 2 (20%) + Final (40%)

Total 2 := HW (10%) + GW (10%) + Best Midterm (30%) + Final (50%)

and use whichever one is higher. Here HW stands for the total homework score, based on the top three homework scores and GW stands for the total group work score, based on the top three group work assignments. Mid 1 and Mid 2 stand for midterm 1 and midterm 2 scores, respectively. I will drop the lowest homework score and the lowest group work score.

Remarks on the marking scheme: (1) The main purpose of the homework and group work is to give students an opportunity to practice and internalize the concepts introduced in the lectures. I will assign small amounts of credit to keep you engaged, but evaluation is only a secondary purpose for these activities.

(2) I have built generous concessions into this marking scheme. Students can miss (or do poorly on) one homework assignment, one group assignment and one midterm without a penalty. These concessions are automatic, no request, justification or explanation required. The flip side is that these concessions are intended to cover all eventualities, including illness and emergencies. Use them sparingly.

Further information will be provided on Canvas.