

MATH 245: Linear Algebra 2, Advanced Section

Winter 2009

Coordinates

Time: 11:30 am–12:20 pm, Monday/Wednesday/Friday

Location: DWE 3519

Course website

<http://www.math.uwaterloo.ca/~amchilds/math245>

Instructor

Prof. Andrew Childs

Email: amchilds@uwaterloo.ca

Office: MC 4031

Office hours: To be announced; also available by appointment.

Prerequisites

Math 146 or permission of instructor.

Antirequisites

Math 126, Math 235.

Textbook

S. H. Friedberg, A. J. Insel, and L. E. Spence, *Linear Algebra*, 4th ed. (Prentice Hall, 2003).

Topics covered

Tensor products, determinants, eigenvalues and eigenvectors, diagonalizability, matrix limits and Markov chains, Cayley-Hamilton theorem, Gram-Schmidt orthogonalization, the adjoint of a linear operator, normal and self-adjoint operators, orthogonal and unitary operators, orthogonal projections, the spectral theorem, the singular value decomposition. Additional topics as time permits.

Evaluation

Assignments 20%

Midterm 30% (4:30–6:20 pm, Tuesday, February 10th; location to be announced)

Final exam 50% (time and location to be announced)

Assignments

There will be weekly assignments, made available on the course website and due at the beginning of class each Wednesday unless otherwise indicated. Students are expected to turn in all assignments. In general, late assignments will not be accepted; please contact the instructor as far in advance as possible if you think an exception is warranted.

You are encouraged to discuss the assigned problems with your classmates and with the instructor, but solutions to the problems should be written independently. Please acknowledge sources of help on your solutions.

Note for students with disabilities

The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.

Academic Integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 – Student Petitions and Grievances, Section 4, <http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm>

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about rules for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 – Student Discipline, <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>

Avoiding Academic Offenses: Most students are unaware of the line between acceptable and unacceptable academic behaviour, especially when discussing assignments with classmates and using the work of other students. For information on commonly misunderstood academic offenses and how to avoid them, students should refer to the Faculty of Mathematics Cheating and Student Academic Discipline Policy, http://www.math.uwaterloo.ca/navigation/Current/cheating_policy.shtml

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 – Student Petitions and Grievances (other than regarding a petition) or Policy 71 – Student Discipline if a ground for an appeal can be established. Read Policy 72 – Student Appeals, <http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm>