Math 245 — Linear Algebra 2 (advanced section)
MWF 11:30-12:20, MC 4064

Instructor: Prof. Kevin Purbhoo
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Course webpage: `http://www.math.uwaterloo.ca/~kpurbhoo/math245/`
Office hours: Mon. 10:30–11:30, Fri. 14:00–15:00 (tentatively)

Suggested Text: S.H. Friedberg, A.J. Insel and L.E. Spence, *Linear Algebra.*

Topics: Matrix algebra: determinants, eigenvectors, companion matrices, exponential of a matrix, stochastic matrices; Vector space constructions: direct sums, dual spaces, quotient spaces, free vector spaces; Canonical forms: Cayley-Hamilton theorem, minimal polynomial, primary decomposition theorem, Jordan canonical form, rational canonical form; Inner product spaces: projections, Gram-Schmidt orthogonalization process, pseudo-inverse, isometries, normal operators, spectral theorem; Bilinear and multilinear algebra: tensor products, the exterior algebra, quadratic forms, symplectic forms.

Prerequisite: Math 146 or permission of instructor.

Marking scheme: 20% homework + 25% midterm + 55% final exam

Homework: There will be (roughly) weekly assignments, due in class. You are expected to turn in all assignments, even if you cannot solve all of the problems. Normally, late homework will not receive any credit. Extensions may be granted under exceptional circumstances, but must be requested at least two days before the assignment is due.

Midterm: The midterm exam will be held on Tuesday June 5, in the scheduled exam slot (16:30-18:20). Any student who misses the midterm without a legitimate reason (i.e. medical, or with the instructors prior permission) will receive a mark of zero.

Policy on missed final exam: In the case of illness during the final exam, a make-up exam or INC grade will only be granted to students who have completed the required term work to satisfactory standards.

Avoiding academic offenses: Students are expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for their actions. Students who are unsure whether an action constitutes an offense, or who need 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, TA, academic advisor, or the Undergraduate Associate Dean. For information on categories of offenses and types of penalties, students should refer to Policy #71, Student Academic Discipline,

> `http://www.adm.uwaterloo.ca/infosec/Policies/policy71.html`

Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy #70, Student Grievance,

> `http://www.adm.uwaterloo.ca/infosec/Policies/policy70.html`

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.