Linear Algebra and Probability

Instructor:	Dr. Vince Matsko
Office:	HSC 119E, x4680
Office Hours:	MW 12:00–1:30
Class Times:	MWF 9:15–10:20 (Section 01), 10:30–11:35 (Section 02), Malloy LL5
Website:	www.vincematsko.com
Texts:	*Linear Algebra Through Geometry,* Banchoff and Wermer, (2nd ed.)
	Introduction to Probability, Grinstead and Snell (open source)

Course Description: Matrix arithmetic and matrix algebra (determinants, adding and multiplying matrices, matrix inverse, using matrices to solve systems of equations), geometric applications of linear algebra (matrices as transformations, vectors in 2- and 3-dimensions, equations of planes, etc.); discrete probability, random variables, discrete and continuous probability distributions (including binomial and normal), expected value and variance.

Learning outcomes: Time permitting, by the end of the course a student will have learned to:

1. Represent a system of linear equations with matrices;

2. Find the general solution of such a system (or determine that none exists);

3. Understand matrix algebra;

4. Understand vectors, vector spaces, bases, and dimension;

5. Understand Determinants;

6. Calculate eigenvalues and eigenvectors of linear transformations;

7. Understand probability models and sampling;

8. Understand independence and conditional probability;

9. Understand random variables and basic descriptive statistics.

Course components:

- Homework: Problems will be assigned on a daily basis. Roughly each week, a homework quiz will be given. For a homework quiz, you will may bring your notebook. Among the problems, there will be two or three which are identical in form to a problem from your homework, but with some slight variation (perhaps just the numbers changed). These quizzes are given at the beginning of class, and arriving late will simply mean you have less time to complete the quiz. No extra time will be given if you are late.

  Please take these quizzes seriously. Since you may use your notes, keeping up with your homework is key to doing well on these quizzes.

- In-class assessments: There will be two in-class exams and a Final Exam. Most questions will be relatively straightforward and based on the homework questions, although some will be more challenging and test your conceptual understanding.

  The dates for the exams are Friday, February 23 and Friday, April 6. There is a cumulative Final Exam **scheduled** for Wednesday, May 16 from 10:00–12:00 (Section 01) and on Monday, May 14 from 10:00—12:00 (Section 02). However, I will be requesting a three-hour time slot for your exams, so the **date and time may change.**

  There are no make-up exams. If you miss an exam for any reason, your Final Exam will count for the relevant percentage of your course grade. You must arrange your end-of-semester travel so that you are present for the Final Exam. Students scheduled for the Wednesday Final may NOT take their exam early on Monday. Any changes in your Final Exam must be communicated by the Dean *in writing* (University policy).

Attendance: You are expected to be in class every day. Simply put, you'll get out of your college experience what you put into it. While in class, you should be paying attention – not texting or sleeping. Cell phones should never ring, and should never be visible (unless used as a calculator during a classroom activity). When quizzes or exams are given, no extra time will be given to a student who arrives late. Just maintain a comfortable classroom environment where everyone can learn as much as they can.

Grading policy:

The course components are weighted as follows:

Course component	Percentage
Homework quizzes	25%
First Exam	20%
Second Exam	20%
Final Exam	35%

Before the Final Exam, your course average will be computed. If your Final Exam score is *higher* than your course average going in, your Final Exam score will be weighted 50%.

Withdrawals and Incompletes: The last day to withdraw from the course is Monday, April 9. If you plan to withdraw from the course, it is your responsibility to complete the necessary paperwork by this date. You will not be allowed to withdraw after this date. An incomplete grade will be given only if you have a serious emergency, such as a medical condition, that prevents you from completing the course. You must produce proper documentation and must be passing the course with most of it complete. An incomplete grade will not be granted to avoid failing the course.

Note that your second exam is on Friday, April 6. Your exams will be handed back on Monday, April 9, along with your course average to date. If you need to drop the course, you may do so during Office Hours on Monday, April 9.

Academic Honesty: As a Jesuit institution committed to cura personalis – the care and education of the whole person – USF has an obligation to embody and foster the values of honesty and integrity. USF upholds the standards of honesty and integrity from all members of the academic community. All students are expected to know and adhere to the University's Honor Code. You can find the full text of the code online at www.usfca.edu/fogcutter. You are encouraged to discuss the homework problems and course material with other students and with me during office hours. However, the homework that you hand in should reflect your own understanding of the material. You are NOT allowed to simply copy solutions from other students or other sources. Complete academic honesty is expected during exams. Cheating on an exam will result in an automatic failing grade (F) for the course.