

MAT220: Fall, 2008
Seattle Central Community College

Instructor: Lawrence Morales, Ph.D.

Phone: 587-6992

Email: MoralesMath@gmail.com

Office Hours: SAM 415 M,W, Thu 11am-12pm or by appointment

Class Web Site: <http://wamap.org>

Prerequisites: MAT126 and with 2.0 or higher and either Maple or Mathematica proficiency as provided in CSC102Q. In class, we will be using Mathematica.

Required Materials:

- Course Text: Visual Linear Algebra (Herman and Pepe). Make sure it has the CD in the inside cover! There is an 11-page Errata sheet on WAMAP.org that lists known errors in the text. Please print it and refer to it during the quarter.
- Calculator
- Access to Maple. (If you don't have it at home, you'll need to spend time on campus.)

WAMAP: Our course calendar, documents, homework sets, gradebook, etc, will be implemented through WAMAP.org. Your username for WAMAP is your Student ID number. Your default password, which can be changed, is the last four digits of your Student ID number.

The Course: The course is an introduction to linear algebra, which is a central and pivotal course for math, engineering, and computer science majors (among others). This course is the first exposure most students have to significant proof-based material that cannot be ignored if one hopes to really understand and master the core material. The course is driven with Maple and explorations on the computer, so it's vital you have some basic Maple experience. Ideally, we'll cover most of the material from Chapters 1 to 8 of the text.

Exams: There will be 2 one-hour exams and a final exam (two hours). Exams can only be made up if you contact me *before* the exams starts and have a valid reason (death in the family or verified illness are examples). You will not be allowed to make up the exam unless you have documentation (doctor note, etc.) of the reason for missing the exam. Exam dates will be announced in class.

Extended Homework Sets: There will be four graded homework sets. You should expect to spend generous amounts of time to finish these and should NOT put them off to the last minute. Doing so will lead to disastrous consequences. Due dates will be announced in class. You should take these seriously and work hard to make them complete, accurate, and neat if you expect get full credit for them. You are allowed to discuss these problems with each other, but what you turn in MUST be a reflection of your own understanding of the material. You may NOT copy solutions from others or allow others to copy from you. If you do so, you will be subject to disciplinary action as outlined by the College. The combined scores from the homework sets will count as one exam, so as you work on them, treat them as exam problems.

Online Homework Problems: You will be assigned online homework problems on a regular basis via WAMAP. These are designed to keep you thinking about the concepts, ideas, definitions, theorems, and basic calculations of the course. Many of these questions are True-False or Multiple Choice. You should pay careful attention to due dates for these assignments.

This Course is Different: This course is very different from most (if not all) of you previous math courses. It is highly dependent on you mastering new definitions, understanding and applying numerous theorems, and working hard to make connections between concepts that emerge in the course (especially in the latter half of the course). You cannot get by simply by learning how to do a bunch of step-by-step problems. You must strive to understand the language and the abstract ideas of the course. Some of you have done very well in previous math courses and will find this course to be extremely difficult and confusing, often frustrating. This is especially true when students try to use successful methods from other courses in this course and see little results. Success in this course will require regular time and effort of a nature you may not have experienced before. I suggest and expect that you will devote at least one hour a day, at least six days a week, to reviewing definitions and theorems, working problems, and thinking about the material. Some days, you will need to spend much more than an hour. But whatever you do, don't underestimate this course. It is full of really beautiful mathematics, but mastering it is not a simple task. I have included a suggested Study-Card format at the end of this syllabus. You should begin some sort of system immediately and use it daily and religiously to study this course's material. It is useful to form regular study groups and to spend individual time daily on this material.

Daily Class Format: Some days we will be working with Maple and on the computers. Other days will be more lecture-based. And we will also have some days that are designated as “Open” to allow some flexibility in our schedule.

Student Behavior: Students will be expected to conduct themselves in a professional manner, showing respect and courtesy to all members of the class. This means (among other things):

- Cell phones, beepers, or other electronic devices are OFF during class.
- No computer, email or Internet activity during class. Violators will be asked to stop in the middle (and in front) of the class.
- Courteous and respectful participation is the norm.
- Full compliance with the Student Conduct Code.

Late Policy: Late assignments are accepted under the following conditions:

- You submit it before I start grading it. If I have started grading it, I will tell you so and will not accept your assignment.
- You lose 20% of any earned points you get on the assignment.

In cases of true emergency (such as serious illness, death in the family, etc) that can be documented, these conditions will apply. However, you must contact me before the assignment is due to inform me of the emergency so I can not start grading the assignments.

Attendance & Participation: Regular and prompt attendance is expected.

Grades:

- | | | |
|-------------------|-------------------------|--|
| ➤ Exams (2): | 100 points each | 200 points total |
| ➤ Final Exam: | 150 points | 150 points total |
| ➤ Homework Sets | 25 points each | 100 points total |
| ➤ Online Homework | May vary per assignment | 50 points total (converted from percent) |

Please note that the combined homework sets count the same as one Exam. Your course percent is found by dividing your earned points by the total number possible. In this course, 75% guarantees a 2.0, and 95% guarantees a 4.0. All other grades will be computed with a linear formula. ($\text{Grade} = 0.1 * \text{Percent} - 5.5$) I do not drop low scores or give extra credit. At the end of the quarter, if necessary, I'll “curve” grades to attain a reasonable grade distribution. I do this by altering the 2.0 and/or the 4.0 cutoff percent and re-computing all other grades with a new linear formula.

Non-Traditional Grades: NC (No Credit) grades are not given in this course. W (Withdraw) grades are given if the paperwork is submitted by the published deadlines (see course listings). I (Incomplete) grades are only given near the end of the quarter for documented emergency situations, where a student is in good standing (2.0 or higher) and paperwork is submitted on time.

Academic Dishonesty: All instances of academic dishonesty (cheating, plagiarism, **file-copying**, etc.) will result in a zero on the assignment and a report being filed on your student record with the Dean of Students. A second incident of academic dishonesty will result in a 0.0 for the assignment, a report being filed on your student record with the Dean of Students, a possible 0.0 for the course, and possible suspension or expulsion from the college. In summary, don't cheat, do your own work, and you'll be fine.

Students with Disabilities Statement: Students with *documented* disabilities, who need course accommodations, have emergency medical information or require special arrangements for building evacuation should contact the professor within the first week of class privately or during office hours.

Students Responsibility: It is the student's responsibility to be aware of all course deadlines and requirements at all times by reviewing the syllabus, being in class to hear important announcements, and checking the course web sites for daily announcements about due dates.

Disclaimer: The professor reserves the right to make changes to this syllabus during the quarter provided it is done so in writing or on the class web site and is made available to students with reasonable advanced notice. Remaining enrolled in the course implies you are bound by the provisions of this document.

I reserve the right to change this syllabus or any of its provisions. Changes will be posted to the class web site and left there for the entire quarter, as well as announced in class.

MAT220 Flash Card Guide

After discussing with a 220 student how to manage all the information in this course, I thought I'd offer a suggested way for you to do so. This method may not work for all of you, or you may have to adapt it to meet your style of studying/learning. Also, this method does not directly help you with proofs, but may help you keep all the terms, theorems, and other facts organized.

As you read/work through a section in the text, create FOUR different categories of 3by5 Flash Cards as follows:

- D** Definitions: These come from the blue boxes in the text that specifically say "Definition"
- T** Theorems: These come from the blue boxes in the text that specifically say "Theorem" or that are given during lecture/class.
- W** Words: These are words or terms that are important,
- F** Facts: These are important facts that we mention in class or that are in the text with dots (•)

Here are some examples:

Definition:

D elementary matrix 3.5 p.168

An elementary matrix is a matrix that is created by performing a single elementary row operation on an identity matrix.

Example: $E = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -5 & 0 & 1 \end{bmatrix}$

E comes from replacing R3 with R3 - 5R1 in I₃

D for definition. Use this to help sort your cards.

Text Section

Page Number so you can look up the context later if necessary.

Maybe draw a blank line here and put what's in red on the back of the card to allow you to quiz yourself on the definition.

Highlight or box the key word or term being defined.

Give an example if possible

If the theorem has a title, place it at the top, or, make up one that will help you remember it.

Theorem:

T Invertibility Theorem 3.5 p. 167

Suppose A is an n by m matrix. Then the statement A is invertible is equivalent to:

- a.) The only solution to $Ax=0$ is $x=0$
- b.) The columns of A are linearly independent
- c.) The system $Ax=b$ is consistent for all b in R^n
- d.) The columns of A span R^n .

Maybe put the dotted line content on the back of the card to allow you to quiz yourself on the content of the theorem

Word:

W **singular matrix** **3.5 p. 164**

A matrix that does not have an inverse is called a **singular matrix**.

Fact:

Give your fact a title or topic to help you identify its relevance.

F **Re: Matrix Inverses** **3.5 p. 162**

If B is the inverse of A, then A is the inverse of B.

If B and C are both inverses of A, **then $B = C$** .

Maybe draw a blank line here and put what's in red on the back of the card to allow you to quiz yourself on the definition.

Depending on the author, some Facts may be classified as Theorems which need to be proved. For this course, when I say "Theorem," I mean one that is either directly specified as such in the text (blue box) or that I identify in lecture as a Theorem (sometimes I may present theorems that are not in the text but I think are important).

You may also want to use the **BACK** side of the card. That is, rather than writing everything on the front side, write out only part on the front and the rest on the back so you can quiz yourself with the cards. You may want to keep you cards sorted by major category (D,T,W or F) to help you study. You should create a study system like this **AS YOU MOVE THROUGH THE MATERIAL**, not the night before an exam, and use it to help you learn, relearn, and re-relearn the material as the quarter progresses.