VMLS - Study Guide Chapter 1 **Name:**_____

Please always include this title page with your PDF. Include your name above.

- Submit your work in Gradescope as a PDF - you will identify where your “questions are.”
- Identify the question number as you submit. Since we grade "blind" if the questions are NOT identified, the work WILL NOT BE GRADED and a 0 will be recorded. Always leave enough time to identify the questions when submitting.
- One section per page (if a page or less) - We prefer to grade the main solution in a single page, extra work can be included on the following page.
- Long instructions may be removed to fit on a single page.
- **Do not start a new question in the middle of a page.**
- Solutions to book questions are provided for reference.
- You may NOT submit given solutions - this includes minor modifications - as your own.
- Solutions that do not show individual engagement with the solutions will be marked as no credit and can be considered a violation of honor code.
- If you use the given solutions you must reference or explain how you used them, in particular...

For full credit, EACH book exercise in the Study Guides must use one or more of the following methods and FOR EACH QUESTION. Identify the number the method by number to ensure full credit.

Method 1 - Provide original examples which demonstrate the ideas of the exercise in addition to your solution.

Method 2 - Include and discuss the specific topics needed from the chapter and how they relate to the question.

Method 3 - Include original Python code, of reasonable length (as screenshot r text) to show how the topic or concept was explored.

Method 4 - Expand the given solution in a significant way, with additional steps and comments. All steps are justified. This is a good method for a proof for which you are only given a basic outline.

Method 5 - Attempt the exercise without looking at the solution and then the solution is used to check work. Words are used to describe the results.

Method 6 - Provide an analysis of the strategies used to understand the exercise, describing in detail what was challenging, who helped you or what resources were used. The process of understanding is described.

1. (20 pts) Reading the book carefully is essential in this class and in all advanced mathematics. This is an exercise in annotation.

For this first exercise, pick a section or page from Chapter one of VMLS.

Read straight through the section once for an overview. Include the following 3 items for #1.

a) Write down your initial thoughts, questions, and first impressions (‘whaaat???’)
b) Now, return to the section and slowly work through each line using a pencil or pen.
    - Expand equations.
    - Identify key concepts and explain in your own words.
    - Make note - is that a vector or a scalar?
    - Fill in missing ideas or steps.
    - Include a screenshot of your annotation.

c) How has your understanding of the section changed?

Include a screenshot of your annotation.

2. (10pts) Solve the Random exercise from the video and Piazza in your own words here.

3. (10 pts) Explain the solution to 1.8 here in your own words. (Since you are given a solution, you will be graded on your ability to explain).

4. (10 pts) Explain the solution to 1.16 here in your own words. (Since you are given a solution, you will be graded on your ability to explain).

5. (50 points) Create a Jupyter Notebook of the following:

The Python **Companion** (linked at the top of the course) includes examples of code that can help you throughout the course and provides the basis for the fundamentals of vector operations we will use throughout the course.

Every week you can use these code elements to illustrate concepts and ideas from the weeks.

This week we guide you through an example.

1. Find the Python Companion and sections 1.1 - 1.4,

2. Select at least 10 code blocks (you may want to do all of them) that look useful.

3. Rewrite (best) or copy and paste each code cell **into your own Jupyter Notebook**.

4. Add notes in your own words in a text block above about the code using the notes given AND incorporate ideas from the book (cite the book page).

5. For each section of code include at least one additional specific example of using the code.

6. **Attach a PDF of your Jupyter Notebook here** to include in the single PDF study guide.