

DEPARTMENT OF THE ARMY  
UNITED STATES MILITARY ACADEMY  
West Point, New York 10996-1786

MADN-MATH

December 19, 2008

MEMORANDUM FOR MA103 Students, Department of Mathematics, USMA

SUBJECT: MA103 Program Director's Memorandum

1. MA103 is a 4.0 credit hour course and therefore, does not follow the Day 1 / Day 2 schedule of a 3.0 credit hour course. The course calendar can be found by navigating through the Course Admin link on the MA103 website (<http://www.dean.usma.edu/math/courses/MA103/index.htm>). In this course, you have an opportunity to learn what mathematical modeling is and how powerful the mathematical modeling you learn can be. You may or may not become a mathematician or an engineer. But your studies in this course will enhance your ability to think critically, a skill that can and will help you in any field or profession. The material that you will study in MA103 is organized into three blocks:

- a. Modeling with Discrete Dynamical Systems (Block I)
- b. Matrix operations and applications (Block II)
- c. Modeling with continuous functions (Block III)

2. Through hard work in each of the blocks above, you will become more successful students and learners in the following five areas:

a. Base of knowledge. You will learn several problem solving techniques in order to formulate and structure powerful mathematical models that can help you do many things. In particular, the experience gained in developing mathematical models in this course will help you answer many interesting questions like what savings plan do I need to begin in order to become a millionaire by a desired age, and how can I manipulate an image on my computer like those in many high tech movies.

b. Technology. You will have numerous opportunities to use powerful software programs to enhance your capability to investigate possible solutions of the mathematical models that you develop in the course. Specifically, you will become competent in the basic commands of a computer algebra system (Mathematica) and of a computer spreadsheet (Excel) in order to make important predictions about things in everyday life that you are concerned about.

c. Communication. Being a good communicator is one of the most important characteristics of being a great leader. The fundamentals in successfully conveying how you want the troops under your command to perform an essential task and in describing your thought process in solving a mathematics problem are the same. All leaders must be able to clearly articulate their thoughts. You will have many opportunities to improve your communication skills both verbally and in writing. These opportunities include board presentations, various writing assignments, and the preparation of a technical report.

d. Confident and competent problems solvers. You will develop modeling and problem solving abilities through in-class experiences, homework exercises, and a group project. These events will require you to analyze real world problems, make critical assumptions, model the problem, solve the

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model, and then interpret your results. Being able to do these things will help you in becoming more confident and competent solvers of all types of problems.

e. Develop habits of mind. Some key components of habits of mind that you will become better at are: creativity, work ethic, thinking interdependently, critical thinking, lifelong learning, and curiosity. You can certainly reach a higher potential if all of the elements are incorporated and pursued simultaneously. Strategies will be implemented in this course that promote and develop each of these for you. Ultimately, you will be introduced to the importance of lifelong learning and will be encouraged to learn how you best learn and to develop good study habits.

3. You must take responsibility for your own learning and participate as an active learner. To realize the goals above, you must do several things:

- Success in this course depends heavily on your daily preparation. Dedicate the time required for success – we have designed this course so that the average student can succeed with between 1-2 hours of daily preparation. If you habitually prepare less than this, your understanding and performance may measurably suffer.
- Come prepared for class with worked or attempted problems, understanding, and questions. Come to class knowing what you don't know so that you can ask questions. Unless otherwise directed by your instructor, you are responsible for the assigned readings and problems prior to coming to class.
- Participate in the instruction and discussion – this is *your* education; take charge!
- Seek assistance when needed – from the text, your classmates, or your instructor. We have some of the most professional and caring instructors teaching our course. Although they want you to succeed, they cannot learn for you.

4. Course Evaluation Plan: Your performance in this course will be evaluated both in and out of class. Out of class efforts consist of homework assignments and projects. In-class assessments consist of written exercises, presentations, Written Partial Reviews (WPRs), and a comprehensive final examination. To evaluate your progress in reaching the goals in paragraph 3 (and to provide you with feedback on your learning), we will have the following assessments:

<u>Event</u>	<u>Points</u>	<u>Percentage</u>
3 Written Partial Reviews (WPR)	750	40.5 %
1 Term End Examination (TEE)*	500	27.0 %
1 Project 2 Parts (125 ea)	250	13.5 %
Instructor Points	350	19.0 %
<b>Total Points</b>	<b>1850</b>	<b>100 %</b>

\*A score of less than 50% on the TEE (regardless of final course average) could result in course failure.

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GERALD C. KOBYLSKI  
LTC, EN  
Program Director