# MATH 413: MODERN APPLIED MATHEMATICS I – FALL 2024


**Instructor**: Dr. Harbir Lamba
E-mail: hlamba@gmu.edu (only email me from your GMU account).
Office: Exploratory Hall Room 4459

Office Hours: Monday and Wednesday 2-3pm or by appointment.
Webpage: http://math.gmu.edu/∼harbir/m413/
Note we will NOT be using BlackBoard. Refer to the webpage and your GMU email.

Textbook: Introduction to the Foundations of Applied Mathematics, Mark H. Holmes, Springer, 2019 (2nd Edition).

We will be covering most of the first 4 chapters of the textbook. These cover some of the most fundamental tools of applied mathematics: non-dimensionalizing problems to reveal the structure of possible solutions; using expansions and perturbations to find approximate solutions; kinetic models (as applied to chemical reactions and population models); and the basics of diffusion processes. These are your Learning Outcomes.

Homework questions will be set after each section is completed. These will not be collected or graded but you are STRONGLY advised to attempt them and write out your solutions as if they would be. You are encouraged to discuss these problems amongst yourselves and to make use of the office hours. I will go through the majority of the homework questions in the following class and/or post them on the web, but you will not benefit from this unless you have attempted them properly beforehand. Note that these homework questions are the ABSOLUTE MINIMUM you should be doing each week.

The course will be evaluated with 4 (1 hour long) in-class tests on September 18th, October 16th, November 6th and November 25th. Your 3 best results will each contribute 20% towards the evaluation and the remaining 40% will come from a (cumulative) final exam on Wednesday December 11th.

The grading scale is:

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| $A^-$ to $A^+$ | 70% to 100% |
| $B^-$ to $B^+$ | 60% to 70% |
| $C^-$ to $C^+$ | 50% to 60% |
| $D$ | 40% to 50% |
| $F$ | 0% to 40% |

If you miss more than one of the in-class exams then you will need to provide very good (and well-documented) reasons for missing EACH of them. There will be NO make-up tests, alternative test dates, or 'extra-credit' assignments. You are expected to abide by the University Honor Code and all suspected violations will be reported to the Honor Committee. No outside materials will be allowed during any of the examinations.

Additional Remarks:
1) Please ask questions in class. If you don't understand something then you are probably not alone and it makes things more interesting for everyone, myself included. Also please stop me if you think I have made a mistake!

2) If you are a student with a disability and you need academic accommodations, please see me as soon as possible and contact the Office of Disability Services at 703 993 2474. All academic accommodations *must* be arranged through that office.

3) It is YOUR responsibility to regularly check the course webpage and your GMU email.

4) Please keep the use of all electronic devices to an absolute minimum and try not to distract either your fellow students or myself.

Finally, you are required to familiarize yourself with the Common Policies that can be found at https://stearnscenter.gmu.edu/home/gmu-common-course-policies/