

# MATH290: Introduction to Advanced Mathematics – FALL 2020

**Instructor:** Dr. Harbir Lamba  
**E-mail:** hlamba@gmu.edu (only email me from your official GMU email account please!)  
**Office:** Exploratory Hall, Room 4459 (not that I will be there much!)  
**Office Hours:** T 4.30–5.30 but see below.  
**Webpage:** <http://math.gmu.edu/~harbir/m290/> .

**Textbook:** A transition to advanced mathematics by Smith, Eggen and St. Andre (Eighth Edition). The course will cover most of Chapters 1–5 and maybe a little more.

## COVID-19 arrangements

Every week (after the first) I will either produce a video or a set of printed notes. It is your responsibility to study these as much as necessary.

My initial idea is that during the Tuesday classtime I will be available for virtual office hours where you can email me with questions and I will respond very quickly. Then every Thursday from 4.30-5.30 we will have an online session, using Blackboard Collaborate (or maybe zoom) which everyone is strongly encouraged, but not required, to attend. During these I will go through some of the homework questions and address any outstanding issues. We'll see how that goes and I reserve the right to change things if it's not going well and/or I think of a better way to do things.

BTW, I have never used Blackboard before and want to use it as little as I can get away with this semester too but there may be things I need to use it for. So check the course home page listed above frequently but also Blackboard too.

## Introduction

MATH 290 is designated as a Scholarly Inquiry course within the Students as Scholars initiative (for general information on this initiative, see <http://oscar.gmu.edu/> ). It is a structured introduction to writing mathematical proofs and, as such, is a transition course into upper level mathematics courses.

The goal of the course is to give students the ability to precisely state and answer mathematical questions and to write careful, correct mathematical proofs. Along the way you will become more familiar with the nature of mathematical research, how proofs are created and communicated, and the typical working tools of the mathematical community. You will also be introduced to some elementary concepts of advanced mathematics including elementary propositional logic, set theory, relations, functions, and cardinality.

This course has been designated by the Math Department as a writing-intensive course. Therefore much emphasis will be laid on correct grammar, good organization and clarity of thought as well as correct logic in all graded work.

## Writing Assignments

There will be approximately 4 writing assignments given throughout the semester. The assignments will involve either a) writing mathematically and grammatically correct proofs to problems, or b) writing a short essay on the history of a fundamental mathematical idea. Your grade for these assignments will be based on the correctness of your proofs and clarity and correctness of your writing. These writing assignments will total at least 3500 words according to the guidelines of the Writing Across the Curriculum Committee. Precise topics, submission details and due dates will be given in class and posted on the course webpage. Collaboration is not permitted on these assignments.

ALL assignments MUST be typed up using some flavor of the mathematical typesetting software TeX — LaTeX is recommended. Links to help with learning LaTeX can be found on the course webpage. No late assignments will be accepted under any circumstances.

## Grading and Exams

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 next class and/or post them on the web, but you will not benefit from this unless you have attempted them properly beforehand. Note that the homework questions are the **ABSOLUTE MINIMUM** you should be doing each week. Asterisked questions in the book have solutions in the back and you should attempt as many extra of those as you feel you need to.

There will be 3 (1 hour long) in-class tests on September 22nd, October 22nd and November 17th. These will be hand-written tests proctored by me online. Your 2 best results (relative to the class average for that test) will each contribute 20% towards the evaluation and 30% will come from a (cumulative) final exam on December 15th. The remaining 30% will come from the written assignments (but note that you **MUST** reach a minimum acceptable standard on those assignments or you will automatically fail the course!). I shall explain the grading system in more detail in the first lecture<sup>1</sup>.

If you miss more than one of the in-class tests then you will need to provide very good (and fully-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) 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 Resources at 703 993 2474. All academic accommodations *must* be arranged through that office.

2) It is **YOUR** responsibility to regularly check the course webpage, the Blackboard coursepage, and your official university email address for announcements. That is especially important this semester!

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<sup>1</sup>NOTE: I DO NOT GRADE ON A CURVE. The formula I use to rank you involves the class average but the grade boundaries are determined by absolute, not relative, performance! If you all deserve an A grade then you will all get an A grade. If you all deserve to fail then you will all fail. I only take the class average into account to cancel out any differences in the difficulty of the tests.