

Syllabus for Math 245, *Introduction to Proof via Discrete Math*, Spring 2017

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Office Hours: MWF 11:00am-12:30pm, and by appointment.

COURSE GOALS: Math 245 is a “bridge course” designed to be a transition for math majors and minors from the computational courses like calculus, to the proof based courses such as number theory and analysis. In this course we will study logic, sets and relations, proof techniques, and discrete math. It is hoped that by the end of the course, you will read, write and think mathematics like a mathematician. Specific topics include mathematical induction, combinatorics, cardinality and Pascal’s triangle.

REQUIRED TEXT: *Doing Mathematics: An Introduction to Proofs and Problem Solving*, Stephen Galovich

SUPPLEMENTAL TEXTS:

L^AT_EX: A Document Preparation System, Leslie Lamport

Mathematics: A Discrete Introduction, E. Scheinerman

How to Prove It: A Structured Approach, D. Velleman

A Transition to Advanced Mathematics, Smith, Eggen and St. Andre

A Discrete Transition to Advanced Mathematics, Richmond and Richmond

Foundations of Higher Mathematics, Fletcher and Patty

Note: These books are for reference only. You do not need to purchase any of them.

GRADING: The grading will be assigned the following scale:

A: 90-100%, B: 80-89% , C: 70-79%, D 60-69%, F: Below 60%

There will be no curves and no extra credit. I will assign +/- on an individual basis. WF’s will not be assigned. Points are assigned as follows:

Quizzes (10) - 100 points, Midterm exams (3) - 100 points each, Homework - approximately 80 points, Final exam - 150 points

QUIZZES: There will be a 10 point quiz each Friday. This quiz will cover material through the previous class. Quiz questions will consist mainly of definitions, theorems, short answers, and short proofs. The 10 best quiz scores will be kept, and the rest will be dropped. There will be no make up quizzes given. The quizzes are a good way for you to gauge your understanding of the current material and to keep up with the homework.

L^AT_EX: As part of our objective to “write” mathematics (as well as to learn it and to speak it) we will learn to use the mathematical typesetting program L^AT_EX. L^AT_EX is the standard typesetting tool of mathematicians all over the world. Whether you will be teaching, working in business or in academia, L^AT_EX will be useful for preparing mathematical documents. See my website for information on installing and running L^AT_EX.

HOMEWORK: Homework will be assigned after each section. We will discuss the homework, but most of it will not be collected. About once a week or so I will assign problems to be typed in L^AT_EX and handed in for grading. Late assignments will not be accepted. In addition, during the semester, you will be required to present a proof to me in my office on the blackboard.

MIDTERMS and FINAL: There will be three midterms during the semester worth 100 points each and a final exam worth 150 points. The questions on the exams will be similar to homework questions and will contain proofs. If you cannot make it to a scheduled exam, you **MUST** contact the instructor **BEFORE** the exam if at all possible, or if an emergency, **WITHIN 24 HOURS** after the exam if you need to schedule a make up exam. Make up exams will only be given for extreme excuses. A doctor's note or some other physical excuse is required.

Dates for exams (subject to change): Midterm I - Friday February 10, Midterm II - Wednesday March 22, Midterm III - Wednesday April 19, **Final Exam** - Section 001 Wednesday May 3, 8:00-10:00am, Section 002 Monday May 1, 8:00-10:00am

CLASS STRUCTURE: Each Friday there will be a quiz during class unless there is an exam on Wednesday, in which case the quiz will be on the following Monday. Homework problems will be discussed at the beginning of class as time allows. The rest of the class will be lecture.

ADDITIONAL HELP: You are encouraged to work together in this class and form study groups. **TALK** about mathematics with each other. **WRITE** down your thoughts and ideas. **SHARE** these ideas with your group and with the class. Go to the library or internet and research topics that interest you or are difficult for you. The supplementary texts listed above are a starting place. You are welcome to e-mail questions to me, but if you are referring to a homework problem, please include the entire question, because I may not have access to a book when I answer your e-mail.

HONOR CODE: You are to abide by the JMU honor code at all times. Ignorance of the law is no excuse. Cheating will not be tolerated and will be prosecuted to the fullest extent. Please familiarize yourself with the honor code here: <http://www.jmu.edu/honor/code.shtml>. When turning in homework or group work, you may work together and discuss the problems, but you must write up the homework to turn in **by yourself**. Every answer requires an explanation, and no two student's explanations will be exactly the same. Copying someone else's homework or copying something from the internet - even if you change a few words or symbols - without citation is a violation of the Honor Code. Do not share your L^AT_EX code with anyone. You are welcome to look at each other's code, but do not share files, and do not copy code from someone else word for word.

FIRST WEEK ATTENDANCE POLICY: At the instructor's discretion, any student registered for a class in the Department of Mathematics and Statistics who does not attend at least one of the first two scheduled meetings of the class **MAY** be administratively dropped from the class. Students will be notified by e-mail if they will be dropped. Students who fail to attend should not assume they will be administratively dropped by their instructor; it is the students responsibility to drop the course on their own or they will receive a grade at the end of the semester. All students are responsible for verifying the accuracy of their schedules and changes made in their schedules.

LEARNING: Your goal in this class is to learn proofs and discrete math. My role is to facilitate that learning. You will get out of this class what you put in to it. There are no shortcuts. Learning is not easy. It takes effort and persistence. It is a struggle. Do not see your mistakes as failures, but rather as learning opportunities! It is the struggle that leads to learning. Embrace the challenge.