Welcome to MTH 241! In this syllabus you will find basic information you need to navigate the course, a description of what we will be studying this semester, and advice intended to help you succeed in the course and make the class time enjoyable and productive. Please read this document carefully and save it as a reference. Don’t worry if some of the mathematical terminology is new to you, we will be starting our study of Discrete Mathematics from scratch and will define all new concepts as they arise.
1 Basic Information

Instructor Information
Instructor  David Offner
Email       offnerde@westminster.edu
Office Phone 724-946-7293
Office Hours MWF 10:30-11:30 in Hoyt 156 or by appointment–just send email!

Course Information
Time and Location  MWF 2-3, PH 107
Course Website  learn.westminster.edu/d2l/home/17436
Textbook  Book of Proof by Richard Hammack
Prerequisite  C- or better in MTH 150

Course website: We will use Desire2Learn to record grades and archive course materials such as this syllabus, problem sets, and tests.

Textbook: You should obtain Book of Proof by Richard Hammack either from the bookstore or from amazon.com. Until you obtain a hard copy, you can see an electronic copy at the course website or http://www.people.vcu.edu/~rhammack/BookOfProof.

Piazza and reading responses: Typically, there will be some reading and problems assigned for every class period. For the reading assignments a reading response will be required, where you will submit a short response in the Piazza forums on the course website by noon on the due date. You are entitled to drop your three lowest reading response grades, so late assignments will not be accepted.

piazza.com/westminster/spring2018/mth241/home

Weekly Quizzes: There will be quizzes approximately once a week. The content of each quiz will correspond roughly to a chapter in the Book of Proof. You will be permitted to take a version of each quiz up to two times, and your two lowest quiz grades will be dropped.

Graded homework: There will be weekly graded homework where you will hand in carefully written solutions to selected problems. You are entitled to drop your two lowest homework grades, so late assignments will not be accepted. Discussion of the assignments with anyone and everyone is encouraged, but all submitted work must be written independently. In particular, you are not permitted to see the actual pages that another student is submitting.

Tests are scheduled for Wednesday, February 21, Wednesday, March 28, and Wednesday, May 2. The final exam is scheduled for Wednesday, May 9, from 11:30 AM to 2 PM. Do not make plans to leave campus before this time as this will be the only time available to take the final exam.

Grades: Your grade will be based on homework, quizzes, tests, and a cumulative final exam. It will be calculated using the more favorable of the following two formulas:
Formula 1

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>40%</td>
</tr>
<tr>
<td>Graded homework</td>
<td>10%</td>
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<tr>
<td>Reading responses</td>
<td>5%</td>
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<tr>
<td>Each test</td>
<td>10% each</td>
</tr>
<tr>
<td>Final</td>
<td>15%</td>
</tr>
</tbody>
</table>

Formula 2

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>40%</td>
</tr>
<tr>
<td>Graded Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Reading responses</td>
<td>5%</td>
</tr>
<tr>
<td>Two highest tests</td>
<td>10% each</td>
</tr>
<tr>
<td>Final</td>
<td>25%</td>
</tr>
</tbody>
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Grade cutoffs will be no higher than A: 93, A-: 90 B+: 87, B: 83, B-: 80, C+: 77, C: 73, C-: 70, D: 60.

Academic integrity: Central to the purpose and pursuit of any academic community is academic integrity. All members of the Westminster community, including students, faculty, staff, and administrators, are expected to maintain the highest standards of honesty and integrity, in keeping with the philosophy and mission of the College.

–Westminster College Undergraduate Catalog, p. 65.

Some forms of academic dishonesty include (but are not limited to): copying a classmate’s work (homework, quizzes, or exams), divulging answers or information to another student during a quiz or exam, using unauthorized aids (e.g., calculator/cell phone programmed with formulas or notes) during an exam or quiz, or archiving course materials in files or on web sites. Academic dishonesty will not be tolerated in this class. The penalty for academic dishonesty is a grade of F for the course. Any case of academic dishonesty is reported to the Dean of the College. Other details of violations and consequences are given in the catalog, beginning on page 65.

Accessibility Statement: Westminster College actively strives for the full inclusion of all our students. Students with disabilities who require access solutions for environmental or curricular barriers should contact Faith Craig, Director of Disability Support Services, located in 209 Thompson-Clark Hall. You may reach her at 724-946-7192 or craigfa@westminster.edu. No accommodations can be given without documentation from the Office of Disability Resources.

Texting and other distractions: Texting, checking your email, reading material unrelated to the course, and participating in other diversions from class are considered disrespectful to the instructor and your classmates. Please turn off all electronic devices during class.

2 Description of the course

Goals of the course: This course is designed to serve as a transition from primarily computation-based mathematics courses to more abstract higher level courses. One way to think about this is that in previous courses you probably focused more on what is true about numbers, functions, and other mathematical objects. In this course, and subsequent ones, we will not only be concerned with what is true, but in understanding and justifying why it’s true. This is the main focus of the Book of Proof. Following this book, we will learn the basic vocabulary, notation, and rules of logic that mathematicians use. The mathematical topics we will be interested in are drawn from discrete mathematics. We will learn the basics of counting using
combinations, permutations, recurrence relations, and other tools of the trade. We
will see some classic problems that will introduce many of the important habits of
mind that mathematicians use to figure out all sorts of amazing things.

**Some specific course objectives:** At the end of the course you should...

- be able to write clear and correct proofs using standard mathematical notation.
- be able to recognize standard logical arguments and use them to justify mathe-
matical statements.
- be able to apply basic counting arguments.
- recognize many common mathematical patterns.
- develop maturity to formulate and solve interesting mathematical problems.

**Course description from the course catalog:** An introduction to discrete math-
ematics. Topics covered include logic, sets, functions, relations, counting, induction,
recurrence relations, graphs, trees, Boolean algebra, and proofs.

### 3 Advice

1. Ask questions! Chances are, if you have a question, so do many other people in
the class, and they will be grateful if you ask. The instructor will be grateful as
well! Discuss questions with your friends and come to office hours. *If you don’t
speak up for yourself, who will?*

2. Take notes in class. If it’s written on the board, it’s worth writing in your notes.
Lectures generally proceed at such a pace that you will not grasp every detail
upon first hearing it. If you have good notes you will be able to go back through
the lecture and understand all of the concepts and details you may have missed
or not understood the first time through.

3. Review your notes. Even if you think you understood everything from lecture,
you will frequently find points you have missed or make connections between
concepts on a second reading. Also, some professors can be so convincing in
lecture that they make difficult concepts seem easy. Reading over your notes
after lecture is a good way to make sure you really understood what was being
presented. Some students use a technique of copying over their notes after class,
writing each step only when they can explain why it’s true.

4. Keep up with the reading and coursework. Mathematical concepts can take
some time to really understand, and you will need to think about them (and
sleep on them) a few times before you really get it. DO NOT put off your work
and try to absorb everything at the last minute!

5. Work with other people on your homework. Besides being more fun, checking
your work with others will help you avoid those little mistakes that cost you
time and points. Trying to explain a concept to someone else is an excellent test of how well you understand it yourself.

6. Know your definitions. You will be asked to be clever on the homework and tests, but the tools you will use will always be the definitions (and theorems proved from the definitions). If you don’t know these you will get nowhere.

7. Write up your solutions on your own. Though working together is encouraged, at some point you are responsible for understanding every piece of the problems, and have to be able to write the complete solutions in your own words.

8. Stay organized. When studying for a cumulative exam, your best resources are your old notes and homeworks. Keep these in order and you will have a good record of what the course is about.

9. Do problems. It’s very easy to listen to someone else explain something, or read about it, and think you understand, but on exams you will be asked to solve problems using these concepts, and doing exactly this is the best way to tell if you are prepared for a test. Re-solve old homework problems from scratch, and do similar ones on your own.