

COURSE OUTLINE FOR MATH 109

Instructor: Nick Marsden, Ewing 258

Text: Finite Mathematics  
Sixth Edition  
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CHAPTER 1: FUNCTIONS AND LINES

| # | Text     | Time |                                                          |
|---|----------|------|----------------------------------------------------------|
| 1 | 1.1, 1.2 | 1    | Functions, Graphs and Lines                              |
| 2 | 1.3      | 1    | Mathematical Models and Applications of Linear Functions |

CHAPTER 2: LINEAR SYSTEMS

| # | Text | Time |                                                                        |
|---|------|------|------------------------------------------------------------------------|
| 3 | 2.1  | 1.5  | Systems of Two Equations                                               |
| 4 | 2.2  | 1.5  | Systems with Three Variables; Matrix Representations of Linear Systems |
| 5 | 2.3  | 4    | Gauss-Jordan Method for General Systems<br>TAKE-HOME TEST              |
| 6 | 2.4  | .5   | Matrix Operations                                                      |
| 7 | 2.5  | .5   | Multiplication of Matrices                                             |
| 8 | 2.6  | 2    | The Inverse of a Matrix                                                |
| 9 | 2.7  | 1    | The Leontief Input-Output Model                                        |
|   |      | 1    | TEST 1, Lessons 1 to 9                                                 |

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CHAPTER 3: LINEAR PROGRAMMING

| #  | Text | Time |                                                           |
|----|------|------|-----------------------------------------------------------|
| 10 | 3.1  | .5   | Linear Inequalities in Two Variables                      |
| 11 | 3.2  | .5   | Solutions of Systems of Inequalities: A Geometric Picture |
| 12 | 3.3  | 1    | Linear Programming: A Geometric Approach                  |

CHAPTER 4: LINEAR PROGRAMMING: THE SIMPLEX METHOD

| #  | Text | Time |                                                           |
|----|------|------|-----------------------------------------------------------|
| 13 | 4.1  | 1    | Setting Up the Simplex Method                             |
| 14 | 4.2  | 2    | The Simplex Method                                        |
| 15 | 4.4  | 1    | Mixed Constraints                                         |
| 16 | 4.5  | 1    | Multiple Solutions, Unbounded Solutions, and No Solutions |

CHAPTER 6: SETS AND COUNTING

| #  | Text | Time |                                                    |
|----|------|------|----------------------------------------------------|
| 17 | 6.1  | .5   | Sets                                               |
| 18 | 6.2  | .5   | Counting Elements in a Subset Using a Venn Diagram |
| 19 | 6.3  | 2    | Basic Counting Principles<br>TAKE-HOME TEST        |
| 20 | 6.4  | 1    | Permutations                                       |
| 21 | 6.5  | 1    | Combinations                                       |
| 22 | 6.6  | 1    | A Mixture of Counting Problems                     |
|    |      | 1    | TEST 2, Lessons 10 to 22                           |

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CHAPTER 7 + Section 8.6: PROBABILITY

| #  | Text | Time |                                                   |
|----|------|------|---------------------------------------------------|
| 23 | 7.1  | 1    | Introduction to Probability                       |
| 24 | 7.2  | 1    | Equally Likely Events                             |
| 25 | 7.3  | 1    | Compound Events: Union, Intersection & Complement |
| 26 | 7.4  | 2    | Conditional Probability                           |
| 27 | 7.5  | 1    | Independent Events                                |
| 28 | 7.6  | 1    | Bayes' Rule                                       |
| 29 | 8.6  | 1    | Binomial Distribution                             |
| 30 | 7.7  | 2    | Markov Chains                                     |

TAKE-HOME TEST

CHAPTER 10: LOGIC

| #  | Text | Time |                          |
|----|------|------|--------------------------|
| 31 | 10.1 | 1    | Statements               |
| 32 | 10.2 | 1    | Conditional Statements   |
| 33 | 10.3 | 1    | Equivalent Statements    |
| 34 | 10.4 | 1    | Valid Arguments          |
|    |      | 1    | TEST 3, Lessons 23 to 34 |

CHAPTER 8: STATISTICS

| #  | Text | Time |                                                                             |
|----|------|------|-----------------------------------------------------------------------------|
| 35 | 8.1  | 1    | Frequency Distributions                                                     |
| 36 | 8.2  | 1    | Measures of Central Tendency                                                |
| 37 | 8.3  | 2    | Dispersion: Range, Variance & Standard Deviation                            |
| 38 | 8.4  | 1    | Random Variables and Probability Distributions of Discrete Random Variables |
| 39 | 8.5  | 1    | Expected Value                                                              |
| 40 | 8.7  | 1    | Normal Distribution                                                         |
| 41 | 8.7  | 1    | Using the Normal Distribution to Approximate the Binomial Distribution      |

TAKE-HOME TEST

CHAPTER 5: MATHEMATICS OF FINANCE

| #  | Text     | Time |                          |
|----|----------|------|--------------------------|
| 42 | 5.2      | 1    | Compound Interest        |
| 43 | 5.3, 5.4 | 2    | Annuities                |
|    |          | 1    | TEST 4, Lessons 35 to 43 |

Review: 3 hours

Final exam, Lessons 1 to 43

## FIRST DAY HANDOUT FOR NICK MARSDEN'S MATH 109 STUDENTS

Welcome to my class. I hope that the term goes well for you. Please take some time to read the following. I think you will find it helpful and informative.

### A. SOME GENERAL COMMENTS

1. HOW IMPORTANT IS REGULAR ATTENDANCE? It is essential that you attend every class. If for some reason you miss a class, you will need to act quickly to get caught up. Get a copy of the notes from one of your classmates. Work through the notes very carefully.
2. PLEASE try to arrive a minute or two before class is scheduled to begin. This will give you an opportunity to get your notes out, and to prepare mentally for the class.
3. HOW MUCH TIME SHOULD I BE SPENDING ON MATH EVERY WEEK? If up to date, a typical student will need to spend a minimum of 60 minutes per day. It is highly preferable that this be done before the next class.
4. CALCULATORS AND OTHER ELECTRONIC DEVICES. Graphing and programmable calculators, translators, and other electronic devices may not be used on any test or on the final exam. Cell phones must be put away. However, you will require a calculator that has statistical capability.

### B. HOW TO GET HELP

1. For the first two weeks of the course, I intend to spend up to 20 minutes each day going over homework problems and any other questions you may have. After that period, we will not be able to afford that much time, but I will fit in as many of your questions as I can.
2. Please come to my office (Ewing 258) for help. You may make an appointment, or just drop in. My official office hours are from 9:30 to 10:20. When you come, bring your notes from the lesson where you are having problems. If you missed that class, I would appreciate your getting a copy from someone. I like to refer to the notes when I am giving help.
3. I strongly urge you to find one or more people in this class who you can study with. For many people, learning mathematics in a social setting with their peers can be very rewarding and productive.
4. Free tutoring is available in The Mathlab, Ewing 224. The lab is open all day and sometimes over the weekend. Although the lab is a great place to go when you are confident of the subject matter in general but you just need a little push in the right direction, I would strongly suggest that you use me first, especially at the beginning of the course. Between us we can work out a strategy for determining what kinds of questions you should always bring to me, and what kinds could be safely answered in the lab.

(over)

C. EVALUATION PROCEDURES FOR THE COURSE

1. TERM MARK. You will be doing a number of take-home tests. These can be done in consultation with other students in your class, but with the help of nobody else. They will be overdue if not handed in at the beginning of the class on the due date, but can be handed in up to one day late with only a one mark deduction.

The term mark is the average of the scores on your in-class tests. However, if your take-home test scores are satisfactory (overall average is at least 70%), you will be allowed to throw out your worst test before the average is calculated.

If you miss an in-class test for ANY reason, you will get a zero. There will be no make-ups. But with decent take-home test scores, that zero will be tossed out.

2. FINAL EXAM. The final exam for this course is to be written by all students on the day and time scheduled. The examinations for this term will be held Apr 18-26. Please make sure you are available during this period.
3. MARK FOR THE COURSE. Your course mark is the larger of:
  - a) The average of your term percentage and your final exam percentage
  - b) Your final exam percentage

The Math Department reserves the right to raise your course mark if it is judged that your in-class tests and final exam were more difficult than those in other years or other sections.

4. LETTER GRADE. Your course mark is then translated to a letter grade using the following table:

|        |        |        |
|--------|--------|--------|
| A+ 95% | B+ 80% | C+ 65% |
| A 90%  | B 75%  | C 60%  |
| A- 85% | B- 70% | D 50%  |

D. TWO MORE THINGS

I strongly encourage you to do all your writing (notes, tests, and final exam) in pencil. That way, you will be able to make corrections without leaving a mess.

Also, if you cannot read something that I wrote down on the board, please ask me right away. Or, ask me at the end of the class. Do not leave the room until all questions on my writing have been answered.