

# MATH 118

## Special Topics in Mathematics

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### *General Description*

#### **Introduction**

Math 118 is a college course designed to provide you with an introduction to selected topics in mathematics. The course is intended for the non-science major, and introduces you to the mathematics in everyday life, with topics that vary from planning mail routes to encoding data. After learning a new mathematical technique, you will be required to demonstrate proficiency with said technique by applying it to real world problems.

The requirements for taking this course are: A score of 520 or higher on the SAT II, Math, Level I, or Level IIC exam; a score of 2 on the Calculus AP exam (or BC sub-score); or a passing grade in Math 110.

The course is organized into four units of study:

- Unit 1 discusses voting and social choice, and will cover Chapter 9 of the text.
- Unit 2 will introduce management science, and will cover topics in Chapters 1 and 2 of the text.
- Unit 3 will discuss your money and resources from Chapter 21.
- Unit 4 will introduce the digital revolution, with topics in identification numbers and Web searches from Chapters 16 and 17.

Every unit will be followed by a closed-book test.

Units are further broken down into lessons. Each lesson will present learning objectives as well as lecture notes and examples to highlight the main ideas and problem-solving techniques used

in the text. You will also find sample problems in the lessons to augment the examples in the text, and to help prepare you for the written exercises, quizzes, and tests.

### **Course Materials**

The text required for Math 118 is *For All Practical Purposes*, seventh edition, Consortium for Mathematics and Its Applications, W.H. Freeman and Company, New York, 2006. You may purchase the text for the Higher Grounds bookstore located in the Friday Center, using the book order form in this manual, or online at <https://s4.its.unc.edu/HigherGrounds/>.

You will need a basic scientific calculator for this course (see below). You may use your scientific calculator on all quizzes and tests; in fact some problems may be very difficult to do without one.

### **Lecture Notes**

The lecture notes included in this manual have been written to augment your reading of the text. These notes are not meant to replace a thorough reading of the text sections assigned in each lesson. Instead, you should use the lecture notes as a supplement to the reading, a source of more examples, and a guide in bringing the various learning objectives together.

### **Sample Problems**

The sample problems introduced in the lessons are meant as a supplement to the example problems in the text. None of the example problems in the text have been duplicated, in order to provide you with as many different examples as possible.

### **Calculators**

As stated previously, a scientific calculator is required for this course. A TI-30X will be sufficient, and is what was used for the calculator explanations in the text. Any TI-83 or higher will also be sufficient. You do not need a graphing calculator, but your calculator will need to be able to use parenthesis, and the financial constant  $e$ . It will also be very beneficial if your calculator has a running screen. If you have a running screen, then when you try and enter  $2+3\times 5$ , you will see all three numbers on your screen at one time, and the answer will be 17. If you try entering the above, and find an answer of 25, then you

have an older model calculator that does not have a running screen, and the order of operations will become very important when entering into your calculator. It is assumed that you have a running screen calculator when reading the lecture notes.

## **Practice Problems**

At the end of each lesson there is a list of practice problems from the text. The only way to master the material presented in this course, or in any math course, is to practice. While these practice problems are not graded, it will be **impossible** (or at least really, really difficult) to pass this course without doing **all** of the practice problems. It is very important that you not only attempt, but that you also understand the practice problems before going on to attempt a quiz or unit test. Please note that an answer key is provided in the back of your text. Also, for any assigned practice problem for which no answer is provided in the text, you will find the answer in the Appendix of this course manual.

## **Quizzes and Tests**

The written work that you must submit will be in the form of twelve quizzes and four unit tests, followed by a comprehensive final exam.

The quizzes will cover material presented in the last one or two lessons, and be representative of material seen in the practice problems. Each quiz will consist of 20 points. There is no time limit for the quizzes; however you should note how long it takes you to complete the quiz. Each quiz is designed to take between 15 and 20 minutes. If you take longer than this to complete a quiz, you should consider reviewing the material presented in the prior lessons. Your lowest two quiz grades will be dropped, and the remaining ten quiz grades will count for 10 percent of your final grade. You may use your textbook and lecture notes when taking a quiz, but I would recommend that you attempt each problem without them.

The unit tests occur at the end of each unit. Each is a **closed-book** (and **closed-notes**) test that is worth 100 points. Each test counts for 15 percent of your course grade. Again, there will be no time limit for the unit tests, but each was designed to take 90 minutes to complete.

## **Study Suggestions**

As mentioned earlier, this course manual is meant as a supplement to the textbook. When attempting each lesson, you should read both the assigned pages from the text and the lecture notes. The following list of learning strategies should make your study efforts more productive:

- Carefully read the Lesson Objectives as you begin each lesson. Pay special attention to main ideas.
- Carefully read the textbook sections for the lesson. Each lesson has assigned pages in the text.
- Reading a math textbook should involve paper and pencil. Don't just read the example problems; work through them with the text as a guide.
- Now carefully read through the Lecture Notes. Again, work through the sample problems as you go.
- Now you are ready to attempt the practice problems. You should refer back to your notes and sample problems if you get stuck. You should also check your work to the odd-numbered exercises in the back of the textbook. Remember these practice problems will not be submitted for grading.
- Carefully review the graded assignments when they are returned to you. It is important to learn from any mistakes made so that you do not repeat them on the next assignment.
- When it is time to take a unit test, it is important that all prior quizzes have been returned to you for review. If you submit a quiz and unit test too close together, there might be a mistake on the quiz, which you then repeat on the test because you haven't received the quiz back. If time is of the essence, and you feel the need to push on, you can always begin the next lesson before taking the unit test.

## **Final Exam and Grading**

Along with the unit tests and quizzes, there will be a comprehensive final exam that counts 30 percent of your final course grade. This will be a supervised exam that you will have three hours to complete. You must score a minimal number of

points on the final exam to pass the course. Also note that your final course grade may exceed your exam grade by no more than one letter grade. You may also replace any one unit test grade with your final exam grade, provided your final exam grade is higher.

$$\begin{aligned} & 0.10 * (\text{quiz average}) \\ + & 0.15 * (\text{test 1} + \text{test 2} + \text{test 3} + \text{test 4}) \\ + & 0.30 * (\text{final exam}) \end{aligned}$$