

Seattle University
ASBE Calculus Review Course
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Text: Forgotten Calculus by Barbara Lee

Note: You should login into the actual course site and post an introductory message by the end of the first week of classes. Those who do not do this may be dropped from the course or asked to withdraw.

Course Description

The purpose of this course is to refresh or introduce you to the basic ideas and techniques of calculus (and some related topics) that you may encounter during your required MBA course work. We will try to understand the concepts as much as possible, given our limited time. More importantly, this course is designed to help you feel a little more comfortable with and a little less intimidated by math so that when you take other "math-intensive" courses in the program, you have some confidence built up. When you finish this class, the main thing I hope you will take away is the notion that you feel more comfortable (than you did before taking this course) diving into a quantitatively intense course.

Course Structure

The course is made up of 8 Topics, each developed around a business-related theme. The Topics are as follows:

- Topic 1: Review of Algebra via Cost, Revenue, Demand, and Profit Functions
- Topic 2: Average Rate of Change via Future and Present Value Calculations
- Topic 3: Instantaneous Rate of Change via Marginal Change
- Topic 4: Derivatives via Marginal Change
- Topic 5: Optimization via Maximum Revenue and Profits
- Topic 6: Optimization via Elasticity of Demand
- Topic 7: Partial Derivatives via Joint Costs, Profit, and Production Functions
- Topic 8: Lagrange Method via Maximizing/Minimizing Subject to Budget/Production Constraints

Each Topic will have the following tasks or assignments that you will complete, typically in the order given below:

- Online lecture video – Watch an “online” lecture of the PowerPoint file. (75 to 120 minutes)
- Lecture project – Complete a short online (WAMAP) project that is based on the lecture and which helps break down a more complex problem into parts. (15 to 40 minutes)
- Online Homework – Complete a series of online problems (WAMAP) to practice using the techniques and understanding the concepts of the topic. (60 to 240 minutes, will vary)
- Online Quiz – Complete a short quiz based on the online homework to test your understanding of the skills and concepts of the topic. (15 to 60 minutes)

Due dates for all assignments will be published on the WAMAP calendar. These due dates are designed to help keep you on track and making progress. This course is not intended to be done all at once at the end of the term. You need to meet the published deadlines. However, if you want to move ahead, you may do so as long as an assignment is available on the site.

Each student will receive 5 “Late Passes” that can be used throughout the quarter for any lecture project, online homework, or online quiz (with the exception of Topic 8 assignments, to insure that grades are

submitted on time.) A “Late Pass” will extend any deadline by 48 hours. However, a “Late Pass” must be activated BEFORE the original due date of that assignment. [There are no exceptions to this.](#)

It is a student's responsibility to be aware of all published due dates, to meet them, and/or to activate a “Late Pass” before the original respective deadline.

If you look at the time estimates above, you’ll see you can expect to spend between 3 and 8 hours per topic, so plan on spending roughly this amount of time per week. Of course, times may vary based on your own level of comfort with the material and the actual topic itself (Topic 5 Online Homework, for example, tends to take most students a lot more time than in most others Topics.) Also, in the summer, when we only have 8 weeks, topics will be condensed and, on average, take a little less than a week each.

Support:

In order to support you in this online environment, we will utilize the following:

- Online Forums – These are forums where you can post questions that you have about the material. All general questions about the material, lecture projects, and online homework will be posted to a public forum so that any replies from the instructor or from other students can be seen by everyone in the course. (The analogy to a “live” course is when students ask questions in class...the answer is heard and potentially benefits more than one person.) [For this reason, general questions about the material, lecture projects, and online homework should not be sent via email or the built-in WAMAP messaging system.](#)
- WAMAP Messaging System – This system should be reserved for questions about your grades or your personal progress in the course that you would prefer to keep between you and the instructor. I strongly prefer this over email, since I check WAMAP more regularly than I check email.

Technology

Since this is an online course, it will be very useful for you to be comfortable with using technology. You will need a computer connected to the internet. Some software that you will need installed include the following:

- Java
- Flash
- Internet Explorer or Firefox (other browsers work OK, but these tend to work the best).
- Latest version of Adobe Reader

It will also be useful for you to be comfortable with uploading attachments, posting and replying in forums, etc.

Pace and Preparation

We will be covering a large number of topics, so they will not be treated in the depth that they normally would be in a typical calculus course. This also means that the course will probably require a significant amount of time and work on your part, since we are reviewing about three quarters of material in one quarter. The bottom line is that you will probably get out of the course whatever you put into it.

If you have never had calculus before or if your algebra skills are weak, you should expect this course to be especially challenging. You should be prepared to spend generous amounts of time to read, practice, and study.

It is assumed that you have had a college-level, intermediate algebra course and are reasonably comfortable with the material in such a course. Topics such as functions, linear equations, quadratic

equations, and rules of exponents will pop up everywhere. We will review some of this material as needed, but if you have never seen it before, or are particular weak in your algebra skills, this course is not appropriate for you. I suggest you either take a course in intermediate algebra at a local community college or make arrangements to review/learn this material before attempting this course. If you need a refresher text/workbook on algebra, try *Forgotten Algebra* by Barbara Lee. It is widely available online.

Assignments

Just about all of the assignments in this course will be completed online via the WAMAP assessment system.

There is a final exam (but no midterm). At this time, my plan is to have it in two parts, and both will be administered online. The first is an untimed assignment where you review all of the topics from the course. Although it is untimed, there is a deadline by which it must be started and finished. The second part will also be administered online but WILL be timed (2 hours). There is no attendance requirement for the final exam.

Assignment Summary (Approximation)

| | | |
|--------------------------|---------------------|-------------------|
| Lecture Projects (WAMAP) | 8 at 15 points each | 120 points |
| Online Homework (WAMAP) | 8 at 30 points each | 240 points |
| Online Quizzes (WAMAP) | 8 at 5 points each | 40 points |
| Final Exam | | 100 points |
| | Total | 500 points |

Getting Credit and Computing Grades

To pass this course, you must satisfy each of the following conditions:

1. Earn at least 80% of all possible points AND
2. Earn at least 70% on the final exam (both parts combined)

If you should need a numeric grade for your employer, here is a breakdown of the grade cutoffs I will use to assign numerical grades. This grade will NOT be recorded on your SU transcript.

| | |
|-----|-----------------------------|
| 4.0 | 95% of possible points |
| 3.7 | 90% of possible points |
| 3.3 | 85% of possible points |
| 3.0 | 80% of possible points |
| 2.7 | 75% of possible points |
| 2.5 | Below 75% but still passing |

WAMAP Tips and Hints

1. Configure your browser and know the display options.

- Make sure your browser and computer are set up to work properly with WAMAP. At wamap.org, run the Browser Check that is available on the home page. This will help you configure your computer so you can see all the correct mathematical symbols in WAMAP assignments.
- When you log in, there are 4 buttons from which to choose. The default is the “Use Visual Display” option, which works best when your browser is properly configured. If you are having difficulty viewing equations or symbols, try the “Force Image Based Display” option. It usually works well.

2. Read the directions for problems.

- Most problems will give you instructions on the kind of answer(s) to use or the format you are supposed to use when you enter your answer(s). Follow those directions carefully. WAMAP cannot read your mind, nor does it know what you intend, so you have to be precise when entering your answer(s).

3. Use the Preview Button.

- Many questions have a Preview button that allows you to preview answers in mathematical notation before you submit them. Use it to insure that what you have typed is really what you intend the system to grade.

4. Watch your variables.

- You need to be careful about the variables you use. If the question asks you to use the variable q , then x won't work because WAMAP sees these as two different things. Hence $3x + 5$ is not the same as $3q + 5$.
- WAMAP also makes a distinction between upper case and lower case variables. Therefore, x is not the same as X . Unless the problems says otherwise, use lowercase variables in your answer(s).

5. Be careful with rounding.

- WAMAP can be very particular (“picky”) about rounding error so learn how to use your calculator efficiently. When doing calculations with a calculator, avoid doing any intermediate rounding. When you round in the middle of a problem, you can introduce enough error into your results so that WAMAP may mark you wrong for an answer that is very close to correct, even though your process was accurate. Round at the END of your calculations process, unless instructed to do otherwise.
- Pay attention to the number of decimal places requested. Round appropriately. (Again, read the directions!)

6. Learn the common entry symbols and syntax.

- If you want powers, such as , you enter x^3
- If you want square roots, such as , you enter $\text{sqrt}(10)$. Note that you need parentheses.
- If you want fractions, such as , you enter $3/4$
- Don't use commas for long numbers. To enter 34,500, simply type 34500.

7. Know and follow the order of operations because WAMAP does.

- If you want to enter something like , you will need to use parentheses to make sure the order of operations is preserved. In this case, you would need to enter $(x+3)/4$

8. Print assignments and organize your WAMAP work.

- Print out assignments and keep them organized in a binder or folder.
- Buy a notebook or binder just for WAMAP work. Do all and only WAMAP work in it.
- Label the top of each page with the assignment title so you can find your work later.
- Clearly number each problem and circle the number so it can easily be found.
- Work in a neat and organized fashion so you (and your professor) can follow your work later.
- Mark the pages where you have questions with sticky notes and bring your notebook or binder to class (or office hours). You can then quickly find problems on which you need help.

9. When in doubt, ask for help.

- If you try a problem two or three times and can't seem to get it right, it could be you're doing the problem incorrectly or just making some simple data entry error. Don't get stuck for too long before you set it aside so you can ask for help or clarification on what the issue might be.
- Don't let WAMAP frustrate you! It's just a computer system. Be smarter than it is and know your limits.

Calculus Study Guide

This guide is designed to give you an idea of how to use Forgotten Calculus (FC) with this course. Keep in mind that FC is primarily a reference and the core material comes from the lectures. Hence, FC does not always coincide with lecture material.

| Week | Textbook Units to Review | Comments |
|------|--------------------------|---|
| 1 | FC1 to FC8 | Supply & Demand in FC5. |
| 2 | FC1 to FC8 | Average Rate of Change is the slope of a line in FC4. |
| 3 | NA | Instantaneous Rate of Change (IRC) is not covered in FC like we discuss it in class. FC11 discusses IRC, but do not read FC11 at this time. Wait until Week 4. |
| 4 | FC9 to FC12 | Marginal functions are discussed in FC11. |
| 5 | FC14 to FC16, FC19, FC20 | The Farmer Harvest problem from homework is in FC20 |
| 6 | NA | Elasticity of Demand is not discussed in FC. Some sources online: http://www.netmba.com/econ/micro/demand/elasticity/price/ http://www.econtools.com/jevons/java/elastic/Elasticity.html |
| 7 | FC28 | We will only cover up to (but on including) the section on the Second Derivative Test. |
| 8 | NA | This is not covered in FC. We will discuss it in class. |