

# MAT 284 Business Calculus, Section M200

## Spring 2009

### Lecturer:

Dr. M. E. Watkins, Professor of Mathematics, 317G Carnegie Building, 443-1500.

Email: mewatkin@syr.edu

Office hours:

Tuesdays, 9:15 – 10:45 am

Wednesdays, 10:00 – 11:30 am and 3:00 – 4:00 pm.

*Also available at other times by appointment.*

### Course Supervisor:

Dr. G. C. Verchota, Professor of Mathematics, 229A Physics Building, 443-1579. Email:

gverchot@syr.edu

**Lectures:** TTh 11:00-12:20 pm in Heroy Auditorium. Lectures will introduce new material, will cover selected homework problems, and will cover some review before examinations. Exams will be given in Heroy Auditorium.

**Recitations:** Each student enrolled in the lecture section 200 must also be enrolled in a recitation section 201 (M @ 9:30), 202 (W@ 9:30), 203 (F @ 9:30), 204 (M @ 10:35), or 205 (W @ 10:35). In most recitation classes there will be a quiz, so be sure that you attend your recitation. TAs will consider homework problems in the recitations and that is the primary place to get questions answered. Students are welcome to attend more than one recitation, if they have further questions.

**Teaching Assistant:** Your teaching assistant for recitations is Mr. Shane Surek, His office is located in Archbold (North entrance), room 105A, and his office hours are:

Mondays, 4:00 – 5:15

Thursdays, 2:00 – 3:15

Fridays, 11:00 – 12:15.

**Course Description:** MAT 284 Business Calculus (3 credits). One-variable differential and integral calculus. Applications to business and economics. MAT 284 may not be taken for credit after successful completion of MAT 285 or MAT 295.

This course is designed for students in the School of Management, students planning to minor in management and other students with a serious interest in management and economics. It has less theory than the other introductory calculus courses, and extensive applications, all involving management and economics. MAT 284 is *not* a part of any sequence meeting the divisional perspectives requirement in the Natural Sciences and Mathematics, and so is usually *not* an appropriate course for students in the College of Arts and Sciences. It does not satisfy any requirement for students planning to major in mathematics, science, or engineering.

**Prerequisite:** MAT 183 (or permission of the instructor).

**Text:** *Introductory Mathematical Analysis, for Business, Economics and the Life and Social Sciences*, by Ernest F. Haeussler, Jr. and Richard S. Paul, Prentice-Hall, Twelfth Edition, 2005.

**Calculators:** A TI-83 plus is required. Calculators with symbolic manipulation capabilities such as the TI-89 or TI-92 may not be used on quizzes or exams.

**Homework:** Homework for the entire semester is listed on the attached sheet; it is due the date following the listed date. It will not be collected, unless otherwise specified during lecture or recitation. Questions on examinations and quizzes will be modeled on homework questions, so it is essential to practice on homework problems. The best procedure to follow is this: Do each homework set by its due date, check your answers against those in the back of the book, and keep a record of those homework questions with which you have difficulty. Watch for these and similar problems to be done in lecture and ask about them in recitation.

**Attendance:** You are expected to attend every class, every recitation, every hour exam, and the final exam. If you miss a class, it is your responsibility to obtain a copy of the lecture notes for that class from another student. You are also responsible for any announcements about changes to the course schedule, the exam schedule, or the course requirements that were made during that class.

**Tests:** There will be three tests (given in lecture) during the semester, as well as a final exam covering the entire course. The final exam will be given on Monday May 4, 2009, in a two-hour period between 8:00 AM and 2:30 PM. The final exam cannot be taken at any other time and has priority over any exam given by another department. **Do not make plans to leave campus before 3:00 PM on Monday May 4, 2009.**

**Make-up tests.** The departmental policy for a missed test is that, if you can justify the absence to the satisfaction of your instructor, then your grade on the relevant portion of the final exam will be substituted for the missing grade. Typically, you will not be allowed to make up more than one grade this way. If you cannot justify your absence from an exam, then you will receive a grade of zero for that exam.

**Quizzes:** There will be eight quizzes. They will be given in your own recitation section. These are the quiz dates:

Mondays: Jan 26; Feb. 2, 16, 23; Mar. 2, 30; Apr. 6, 13.

Wednesdays: Jan. 28; Feb. 4, 18, 25; Mar. 4; Apr. 1, 8, 15.

Fridays: Jan. 23, 30; Feb. 20, 27; Mar. 6, 27; Apr. 3, 17.

No make-up quizzes will be given; absence from a quiz counts as a zero. However, the lowest quiz grade will be dropped when your final grade is calculated. If you know in advance that you will have to miss a quiz or exam because of some major event, you should discuss this matter with your instructor or TA beforehand; it *may* be possible to take the quiz with another recitation section.

**Grading.** Your semester average will be based on your performance on the final exam, the three hour tests and your best seven quizzes. These components will be weighted as follows:

Final Exam	25%
3 Hour Tests	20% each
Quizzes and Homework	15%

Your semester course grade will be determined from your semester average as follows:

93 – 100	A	77 – 79	C+
90 – 92	A-	73 – 76	C
87 – 89	B+	70 – 72	C-
83 – 86	B	60 – 69	D
80 – 82	B-	Below 60	F

**Academic Integrity:** The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. . Giving aid to another student on an exam or quiz is just as serious as receiving it, and can be punished in a similar fashion. Students have a right to appeal all such sanctions.

**Cheating:** Forbidden. Penalties for cheating on a test or quiz can range from receiving a grade of zero on the test to receiving an F for the course. All instances of academic dishonesty will be reported to the College Committee for Student Standards.

**Students with Disabilities:** Students who may need academic accommodations due to a disability are encouraged to discuss their needs with the instructor at the beginning of the semester. In order to obtain authorized accommodations, students should be registered with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498 and have an updated accommodation letter for the instructor. Accommodations and related support services such as exam administration are not provided retroactively and must be requested in advance.

**Problem Resolution:** Please inform your TA or your lecturer promptly of any problems you have with this course. Problems you cannot resolve with your TA should be brought to the attention of your lecturer. Problems you cannot resolve with him should be brought to the attention of the Associate Chair, Professor Terry McConnell.

**Assignments.** Each homework set is due in the class following the date on which it is listed. Homework will not be collected, unless otherwise specified during lecture or recitation.

- 1/13**      **1.1:** 9, 10, 11, 13, 17, 25, 27, 28, 29, 32, 33, 39, 40. **1.3:** 1, 3, 5.
- 1/15**      **1.3:** 6, 7, 8, 9. **2.1:** 5, 9, 13, 17, 21, 23, 25, 27, 29, 30, 31, 39, 41, 42, 45, 46, 47, 48, 49. [Particularly important examples of functions are profit, total cost, total revenue, fixed cost (a constant function) and the explicit examples that arose in the previous homework.]
- 1/20**      **2.2:** 1, 3, 9, 11, 13, 15, 17, 19, 21, 31, 32, 33. **2.3:** 1, 3, 5, 7, 9, 11, 13, 14, 15, 17, 19.
- 1/22**      **2.5:** 1, 3, 5, 9, 11, 13, 16, 18, 23, 39, 41, 44. **3.1:** 1, 3, 5, 7, 10, 11, 13, 15, 19, 20, 21, 22, 23, 24, 25, 27, 29, 31, 33, 35, 37, 39, 51, 53, 55, 57, 59, 61, 71, 72. Write a general linear equation of the line which passes through (-1,3) and is parallel to the line  $y=4x-5$ .
- 1/27**      **3.2:** 1, 3, 5, 7, 9, 15, 17, 19, 21, 23, 25, 26, 27. **3.6:** 1, 3, 9, 15, 17, 18, 19.
- 1/29**      **3.6:** 21, 24. **4.1:** 1, 3, 11. **4.2:** 1, 3, 4, 5, 7, 9, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49.
- 2/3**      **4.2:** 50, 51, 52, 53, 55, 59. **4.3:** 1, 3, 5, 7, [omit 9], 11, 12, 13, 15, 16, 17, 19, 20, 21, 23, 25, 29, 31, 33, 35, 37, 39, 40, 41, 45, 46, 47, 48.
- 2/5**      Catch-up & Review for Exam 1.
- 2/10**      **Exam 1.**
- 2/12**      **10.1:** 1, 3, 9, 11, 13, 15, 17, 21, 22, 23, 25, 27, 28, 29, 31, 33, 35, 37, 38, 39. **10.2:** 10, 13, 21, 23, 25, 27, 29, 39, 49, 59. **10.3:** 1, 5, 9, 12, 25. Know the definition of  $e$ .
- 2/17**      **11.1:** 3, 5, 7, 9, 12, 15. Know the definition of derivative. Be able to write it or recognize it, both in general and for a specific function. **11.2:** 1, 2, 3, 7, 11, 15, 17, 23, 25, 33, 37.
- 2/19**      **11.2:** 41, 45, 47, 57, 67, 69. **11.4:** 1, 3, 5, 15, 17, 21, 27, 33, 35.
- 2/24**      **11.1:** 19, 21, 23, 25. **11.2:** 75, 77, 83. **11.5:** 1, 3, 5, 7, 9, 11, 15, 19, 23, 25, 33, 41.
- 2/26**      **12.1:** 1, 3, 5, 11, 15, 25, 27, 29, 31, 39, 41, 43. **12.2:** 1, 3, 5, 9, 10, 11, 12, 13, 15, 17, 21.
- 3/3**      **12.7:** 1, 3, 5, 7, 9, 11, 13, 15, 17, 19. **11.1:** 11 (use the definition of derivative!) **12.2:** 25, 27, 28.

- 3/5**            **11.3:** 13, 15, 19, 21, 23, 25, 30, 41, 45. **11.4:** 59, 60, 65, 66, 72. **11.5:** 65, 66, 71. **12.2:** 33, 35, 41, 45.
- 3/17**            Catch-up & Review for Exam 2.
- 3/19**            **Exam 2.**
- 3/24**            **14.2:** 1, 3, 5, 7, 9, 13, 15, 17, 21, 26, 27, 36, 38, 39, 41, 43. **14.3:** 1, 2, 13, 15, 9, 10, 11, 21.
- 3/26**            **13.1:** 1, 3, 5, 7, 9 (include sketch), 11 (include sketch), 14, 18, 23, 35. 53, 57, 59,  $y=2x^3+3x^2+6x+7$  (include sketches), 67, 68, 70, 71.
- 3/31**            **13.3:** 7, 9, 29, 35, 47, 53, 63, 65, 68. **13.4:** 3, 5, 8.
- 4/2**             **13.6:** 5, 7, 11, 17, 18, 19, 20, 27.
- 4/7**             **12.3:** 1, 3, 5, 7, 9, 11, 15, 16, 17, 19. (You may use the fact that  $dq/dp=1/(dp/dq)$ .) [You need to know how elasticity of demand is related to revenue, as described at the end of **12.3.**]
- 4/9**             **13.6:** 27, 29. [Hint: Read Example 5 in **13.6.**] Do the following three problems that view the elasticity of demand as the ratio in the first paragraph of **12.3:**
- #1) At \$5 per ticket a company has 1,000 customers. At \$4 per ticket there will be 1,200 customers. Compute the elasticity and tell whether the price should be increased or decreased.
- #2) Fare = \$16. A \$2 decrease will cause a 5% increase in demand. Compute and tell whether the price should be increased or decreased.
- #3) Same as #2, but a \$2 increase and a 15% decrease.
- [You are not responsible for the proof at the end of **12.3**, but you need to know the conclusions of that proof.]
- 4/14**            **13.6:** 31, 32, 34. **14.3:** 20.
- 4/16**            Catch-up & Review for Exam 3.
- 4/23**            **Exam 3.**
- 4/28**            Review for Final Examination

**5/4 (Monday) Final Examination.** The final covers the entire course and will be given during a 2 hour interval, to be specified later, that will occur between 8:00 am and 2:30 pm (Period 12).