NOTE: Business Calculus will be using a new text in the spring of 2006. Course notes will be available in the online manual at www.austincc.edu/mthdept5/mman05

Students who register for this course need to have completed a prerequisite course that has treated both differentiation and integration of polynomial, rational, log, and exponential functions. Students without these skills, with a grade of less than C in the preceding course, or who have taken the preceding course more than 18 months ago are not likely to do well in MATH 1476. Such students should be strongly urged to go to late registration and sign up for MATH 1425.


Errata sheet: The course committees have prepared an errata sheet for the textbook, which is included in the MATH 1425 Student Handout. Please make this available to any student who has not already received it.


Optional for instructor: Most instructor aids will, in general, be for a different, more inclusive, edition of the text but can be modified by the instructor as needed. The list follows and a summary of how the material compares to the Special Edition text will be available soon.

  - Instructor's Resource Manual (0-13-573221-2)
  - Windows Custom Test (0-13-592890-7)
  - MAC Custom Test (0-13-592908-3)

General Comments: Throughout the course, the applications problems should be emphasized. Most are quite straightforward, so students don't struggle too much. On the whole, business calculus students are not interested in becoming adept in mathematics, but can be coaxed into paying attention to applications to a certain extent. Another feature of the Special Edition is that each chapter ends with a special group of problems prepared by John Gilbert and Ray Heitman at The University of Texas. These should be used to enhance the material and are intended to be used where appropriate.

Testing: Remember that the business calculus courses should place emphasis on application problems. At least 30% of the overall testing should be word or application problems.

Transferability: This course does transfer to UT-Austin and to other schools that have a two-semester Business Calculus sequence. Students who transfer to University of Texas must take both Business Calculus I and Business Calculus II at ACC to meet UT’s math requirements for business majors. ACC also has students who transfer to Texas State, Texas A&M and other schools that require Business Calculus I and Finite Math.
**First Day Handout:** In addition to the sheet Information for Students provided for your use, you must prepare for students a first day handout which includes your contact information and office hours and explains the testing, grading, and homework procedures for your section of this course.

**Comments on the Chapters:**

**Chapter 5: Additional Integration Topics**
The preceding course at ACC ends with section 2 and this course starts with section 3 of this chapter. Students usually need to have a review of differentiation and integration at the beginning of the course. You should review the basic derivative and anti-derivative rules and substitution before introducing integration by parts. Probably it is best to use first section on integration rules and the section on substitution from the previous chapters to review these rather than the first two sections of this chapter. Chapter 3 section 7, L’hôpital’s rule needs to be covered as it is no longer included in MATH 1425. Improper integrals are no longer in the text but they should be explained before the chapter on continuous probability theory where such integrals are used.

**Chapter 6: Multivariable Calculus**
Even though part of Chapter 6 is covered in MATH 1425 it should be treated as new material in this course. This is a long chapter with a great variety of material. Hence, the syllabus suggests a test after section 3 (covering both the material from the previous chapter and the first part of this chapter). It is important in section 1 to have the student understand what a function of two variables is and to give the student a sense of graphing in 3-space since this will be used in section 2 to interpret the partial derivative. However, do not go into great detail about such graphing. There should be two points emphasized in section 2: the mechanics of taking partial derivatives and the geometric and practical interpretation of the partial derivative as it relates to marginal analysis for functions of two variables. You may want to have students review the one variable case in the last section of the chapter on the derivative. The figure in section 2 is important.

In section 3, remind the student this extrema test is similar to the second derivative test in one-variable calculus. The Lagrange multiplier technique in section 4 should not be omitted.

Section 5 is one of the most important in the course. It is a nice application of maxima-minima techniques from section 4 and shows the students (almost all of whom will be required to take a statistics course) why the coefficient formulas in linear regression have the form they do. This is not a statistics course. Hence, the presentation should go beyond just plugging in the formulas for least squares approximation. On a test, I always require students to do a problem which imitates the step by step development of the normal equations. In other problems, I recommend they use the formulas for the slope and intercept.

In sections 6 and 7, problems involving changing the order of integration help discover if students really understand the various processes.

**Chapter 7: Differential Equations**
Do not overly emphasize the graphing in section 1. Do the business application on equilibrium price. The treatment of logistic growth in section 2 is optional. In section 3, I think it is far preferable to emphasize the logical development of the use of the integrating factor and discourage students from merely memorizing the theorem about separation of variables. In section 4, omit characteristic equations with complex roots since the business calculus students do not have trigonometry as a prerequisite. Do the rest of section 4.
Chapter 8: Taylor Polynomials and Infinite Series
Sections 1 & 2 are required while sections 3 & 4 are strongly recommended. Try to emphasize applications where possible.

Chapter 9: Numerical Techniques
You should do sections 1 and 2 so that students have a taste of how numerical methods work, their usefulness, and the fact that "real world" problems are not always neat. Some instructors have found that use of a computer spreadsheets for illustration and special assignments has served to put life into this topic. Use of this technology tends to motivate students to better understand the material. You may omit Section 3, if you are pressed for time.

Chapter 10: Probability and Calculus
This is an extremely important chapter, along with Multivariable Calculus the other "central" chapter of the course. If you have not already done so you need to explain improper integrals before section 4 of this chapter. Yes, you do need to spend time on finite probability. The binomial distribution with the associated histograms makes a good transition to continuous probability. Point out the many applications of the Poisson density and that it is a "discrete" approximation for the binomial under certain conditions just as the normal density is a continuous approximation of the binomial. Students will have a tendency to confuse density functions and cumulative distribution functions. To emphasize the difference, I suggest you always say "cumulative distribution." In the continuous case, be sure to relate the measure of probability to area under a curve. Section 7 is important since many of these students will go on to take statistics. Treat it thoroughly. In section 6, beta is optional. (This special case of the beta distribution has mean between 1/3 and 1. To get a smaller mean, we must use a more general case. Notice this when making up exam problems with the beta distribution, like example 31.)

Chapter 11: Linear Inequalities and Linear Programming
The focus of this material is geometric linear programming in Section 2 and an introduction to the algebraic method of linear programming known as the simplex method as found in sec. 4.
First Day Handout for Students

MATH 1476 Business Calculus and Applications II

Section --------- Campus ----Room------Day &Time-----------

INSTRUCTOR: ---------------------------------------------
Office:  ----------------------
Phone:  ----------------------
e-mail:  ----------------------
web page:  ----------------------
Office Hours:  You must specify your office hours
Others by appointment.

COURSE DESCRIPTION

MATH 1476 BUSINESS CALCULUS AND APPLICATIONS II (4-4-0). A course treating multivariable calculus and its applications for business students, as well as selected other business applications. Topics include functions of several variables and their derivatives, partial differentiation, optimization problems and LaGrange multipliers, special methods of integration, differential equations, probability and calculus, Taylor polynomials and infinite series, and topics in matrix theory and linear programming. Prerequisites: MATH 1425 or MATH 2413 or the equivalent. (MTH 1684)

PREREQUISITES: MATH 1425 or MATH 2413 or the equivalent. (MTH 1684)

COMMON COURSE OBJECTIVES: MATH 1476, Business Calculus II

To the instructor: These are to be printed in hard copy on the handout and can be found at: http://www2.austin.cc.tx.us/mthdept2/tfcourses/obj1476.htm

REQUIRED TEXTS/MATERIALS

Calculator: Students need either a scientific or business calculator. If you cannot purchase one, they are available from the library. Graphing calculators are fine, but their use may be restricted on the graphing test. Most ACC faculty are familiar with the TI family of graphing calculators. Hence, TI calculators are highly recommended for student use. Other calculator brands can also be used. Your instructor will determine the extent of calculator use in your class section.

INSTRUCTIONAL METHODOLOGY

This course is taught in the classroom primarily as a lecture/discussion course. This class will also have a computer lab component.

COURSE RATIONALE

This is the second course in a two-course business calculus sequence. The course covers more multivariable calculus, differential equations, probability, numerical techniques and linear
programming. The course stresses applications in business and economics, and is intended to give students the appropriate conceptual and computational mathematical background for future study in business.

EVALUATION/GRADING SCHEME
The instructor is to insert his/her own policy if any on the following:
Grades     Testing in class or testing center or both.
Homework   Corrections:
Retake/makeup: Lab requirements:
Student participation:

Incomplete Grade Policy
Incomplete grades (I) will be given only in very rare circumstances. Generally, to receive a grade of "I", a student must have taken all examinations, be passing, and after the last date to withdraw, have a personal tragedy occur which prevents course completion.

Attendance/ Withdrawal Policy (withdrawal deadline is -------)
Attendance is required in this course. Students who miss more than 4 classes may be withdrawn. It is the student's responsibility to initiate all withdrawals in this course. The instructor may withdraw students for excessive absences (4) but makes no commitment to do this for the student. After the withdrawal date, neither the student nor the instructor may initiate a withdrawal.

Reinstatement policy: The instructor is to insert his/her own policy if any

MATH 1476
Course Syllabus

<table>
<thead>
<tr>
<th>Week</th>
<th>16-Week Semester</th>
<th>11-Week Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review, 9.1</td>
<td>Review, 9.1, 9.2</td>
</tr>
<tr>
<td>2</td>
<td>Review, 9.2</td>
<td>5.3, (5.4), 3.6</td>
</tr>
<tr>
<td>3</td>
<td>5.3, (5.4), 3.7</td>
<td>7.1, 7.2, 7.3</td>
</tr>
<tr>
<td>4</td>
<td>7.1, 7.2, 7.3</td>
<td>7.4, 9.3, Test</td>
</tr>
<tr>
<td>5</td>
<td>7.4, 9.3</td>
<td>6.1, 6.2, 6.3, 6.4</td>
</tr>
<tr>
<td>6</td>
<td>Test, 6.1, 6.2</td>
<td>6.5, 6.6, 6.7</td>
</tr>
<tr>
<td>7</td>
<td>6.3, 6.4, 6.5</td>
<td>8.1, 8.2, (8.3, 8.4), Test</td>
</tr>
<tr>
<td>8</td>
<td>6.5, 6.6, 6.7</td>
<td>10.1, 10.2, 10.3</td>
</tr>
<tr>
<td>9</td>
<td>8.1, 8.2</td>
<td>10.4, 10.5, 10.6, 10.7</td>
</tr>
<tr>
<td>10</td>
<td>(8.3, 8.4), Test</td>
<td>Test, 11.1, 11.2</td>
</tr>
<tr>
<td>11</td>
<td>10.1, 10.2, 10.3</td>
<td>11.3, 11.4, Quiz</td>
</tr>
<tr>
<td>12</td>
<td>10.4, 10.5</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>10.6, 10.7</td>
<td></td>
</tr>
</tbody>
</table>
Please note: schedule changes may occur during the semester. Any changes will be announced in class.

STUDENT SERVICES
The web address for student services is: http://www.austincc.edu/rss/index.htm
The ACC student handbook can be found at: http://www.austincc.edu/handbook/

TESTING CENTER POLICY
ACC Testing Center policies can be found at: http://www.austincc.edu/testctr/
When a test is given in the testing center a deadline will be given and if a test is not taken by that deadline it will be considered as a missed test, see grading policy above.

INSTRUCTIONAL SERVICES
The web address is: http://www.austincc.edu/evp/newsemester/index.htm
then click on “Campus Based Student Support Overview”.

Course-Specific Support Services
Sometimes sections of MATH 0165(1-0-2) are offered. The lab is designed for students currently registered in Business Calculus and Applications II, Math 1476. It offers individualized and group setting to provide additional practice and explanation. This course is not for college-level credit. Repeatable up to two credit hours. Students should check the course schedule for possible offerings of the lab class
ACC main campuses have Learning Labs which offer free first-come first-serve tutoring in mathematics courses. The locations, contact information and hours of availability of the Learning Labs are posted at: http://www.austincc.edu/tutor

The following statements will be included and instructors must use the statements provided by the college/mathematics department and found in the front part of this Manual. Go to www.austincc.edu/mthdept5/mman05/ Insert full statement for each of the following in your syllabus.

Statement on Students with Disabilities

Statement on Scholastic Dishonesty

Recommended Statement on Scholastic Dishonesty Penalty

Statement on Academic Freedom

Student Discipline Policy