Purpose of the course: This course is designed to teach students the algebraic and trigonometric modeling concepts needed for scientific/engineering calculus. It is not simply a review of college algebra and trigonometry. Topics in this course will sound familiar, however, the approach taken in presenting the information is from a calculus perspective.

Who are your students for this course: Students will enter this course from a variety of backgrounds. Students who begin their sequence of mathematics courses at ACC in developmental mathematics and are planning to take scientific calculus will take Intermediate Algebra (MATD 0390), College Algebra (MATH 1314), followed by Trigonometry (MATH 1316), and then this course. Finally, some students will come from a high school precalculus course. Typically, such a course will incorporate traditional trigonometry topics.

Informing Students about prerequisites: The department is concerned about how many students do not correctly understand the prerequisite sequence for Calculus I. We have agreed that the handout called Prerequisites for Calculus should be distributed to all students in Intermediate Algebra, College Algebra, Trigonometry, Precalculus, and Calculus I this year. Please do that.

What formulas should students entering Calculus I know from memory? We expect the students to leave Precalculus knowing the most frequently used trigonometric identities: the Pythagorean identities, sum and difference formulas, double angle formulas, and half-angle formulas. They should be comfortable with volume and surface area of rectangular solids and cylinders; area formulas for triangles, squares, rectangles, and circles; perimeter and circumference. The mathematics department does not expect students to memorize all the formulas in this or any text.

Testing: There is one testing scheme presented in the "Notes for Students" that organizes the material into 4 exams in the following way: Exam #1 – chapter 1 & 2; Exam #2 – chapters 4, & 5; Exam #3 – sections from chapters 6, 7, 10, & 8; Exam #4 – chapters 9, 11, &12.

We recommend that you do most of your testing in class, though your may want to give one test in the Testing Center. The primary reason for this recommendation is the use of graphing calculators. The security of the tests is compromised as soon as one student leaves the Testing Center with a graphing calculator in hand. The calculator is sophisticated enough that a clever student can store information about the test in the calculator. How much depends on how creative the student is. Another possible use for the Testing Center is to give a "two-part" exam where the students may not use a graphing calculator on one portion, but then use the calculator on the other portion. The "non-calculator" portion could be given in the testing center. Even with this precaution you should still use at least two different versions for any exam placed in the testing center.
**Comments about the text and course:**

**Applications:** Throughout the course we want to emphasize applications as a way to illustrate the uses of algebra skills.

**Graphing calculators:**
A committee formed by the mathematics task force to study calculator usage in non-calculus classes made the following recommendations:

i) Our courses are intended to be mathematics courses, not courses in how to use a graphing calculator. However,

ii) Students should be taught to graph both by hand and with a graphing calculator.

iii) Instructors and students may want to use graphing calculators for finding zeros of functions, for polar graphs, and parametric curves.

Changes to Second Edition: These changes are highlighted on page viii of the preface. It would be helpful for you to read this page if you have taught from the previous edition. One particular change of note is the inclusion of inverse functions in chapter 2 prior to the chapters on exponential and logarithmic functions. The treatment in chapter 2 is sufficient (1-1 functions) for moving on to chapters 3 and 4. Chapter 8 includes a more thorough discussion after composition of functions is presented in section 8.1.

**Instructors Manual:** You will want a copy of this supplement. Each and every section from the text has suggested lesson plans, in-class activities, suggested homework problems, as well as section goals and key points. Also, often there are suggested time frames for either the length of time to spend on the lesson or for how much time you might spend on a particular activity. In addition there is a test bank that is designed somewhat different than ones you may have seen in the past. There are several sample test questions broken down per section. You may use some as review questions or as actual test questions.

**Student Study Guide:** We recommend the use of the student study guide. For each section in the text, the study guide has approximately five questions that correspond to the lesson. These may be used in a variety of ways. You may use them as preview questions to set-up additional lecture/group activities, as a review at the end of class, or as a review at the beginning of the next class period.

**Additional Supplements:** A Graphing Calculator Guide for the TI 83/82, Instructors Solutions Manual, and others, (see p.viii of text). Feel free to request any and all of these.

**Calendar:** The only suggestion in the schedule that deviates from the chapter sequence is after chapter 7. The two sections about vector properties in chapter 10 may be moved to follow chapter 7. This is only a suggestion.

**Suggested Homework Functions Modeling Change**

The new suggested homework will follow at a later date. However, the textbook has arranged the homework sections into two parts – exercises and problems. The “exercises” tend to have more routine or straightforward solutions. The “problems” are more likely to require multiple steps, applications, or critical thinking skills. We recommend that you assign homework from both portions. Also, there are “tools” sections dispersed throughout the text. If you feel your class needs some routine review problems, then look to these problem sets.
Prerequisites for Calculus

There are two calculus sequences at ACC (and at most colleges) -- Business Calculus and Calculus. The prerequisite sequence is different for these. Depending on background, students may start the prerequisite sequence at different places:

- Intermediate Algebra (MATD 0390)
- College Algebra** (MATH 1314)
- *Trigonometry (MATH 1316)
- Precalculus (MATH 2412)
- Calculus I (MATH 2413)
- Calculus II (MATH 2414)
- Calculus III (MATH 2415)

Where to start: The only way that students may skip courses in a sequence is to begin higher in the sequence, based on current knowledge of material from high school courses.

1. A student who needs a review of high school Algebra II will start in Intermediate Algebra (or below.)
2. A student who completed high school Algebra II, but no higher, and whose assessment test score indicates that he/she remembers that algebra, will start in College Algebra or Math for Business & Economics. A substantially higher assessment test score enables the student to start in Trigonometry.
3. A student who completed some precalculus, elementary analysis, or trigonometry in high school, and whose assessment test score indicates that he/she remembers algebra, is eligible to start higher in the sequence than College Algebra. Check the catalog or the math web page.***

* The material in the Trigonometry course requires that students are quite adept with the skills from high school Algebra II (Intermediate Algebra). Some students will achieve that level of skill in the College Algebra course if their placement score is high enough, while others need an additional semester of work on algebra that is done in two courses, Intermediate Algebra and College Algebra.

** Some students who are very successful in College Algebra are tempted to skip either Trigonometry or Precalculus and enroll in Calculus I. That is not acceptable. Trigonometry topics are essential to success in Calculus, and while it is true that the topic list for Precalculus has only a few additions from the topic list for College Algebra, the level of sophistication of the presentation and the problems on all topics is greater in Precalculus. That increased sophistication is necessary for an adequate background for the Calculus sequence. ***

Notes about the Business sequence: Texas State University requires Math for Business and Economics and Business Calculus I. Students who will attend the UT College of Business must complete the entire Business Calculus sequence before transferring. For more information, including requirements for UT economics students, see http://www.austinec.edu/mthdept2/notes/1425.html *** For additional information, including prerequisite review sheets for most courses, see http://www.austinec.edu/math/
First Day Handout for Students
MATH 2412
Precalculus: Functions and Graphs
2006-2007

Section Number & Synonym:  Time of class:  Campus & Room #:  

Instructor's Name:
Phone numbers (including ACC voice mail for adjuncts)
Office hours and location of office
Information on how conferences outside of office hours can be arranged
e-mail address
Web page (if any)

COURSE DESCRIPTION
MATH 2412 PRECALCULUS: FUNCTIONS AND GRAPHS (4-4-0). This is a course designed
to prepare students for MATH 2413 Calculus I. Content includes algebraic, logarithmic, exponential,
and trigonometric functions and equations; parametric equations; and the polar coordinate system.

Prerequisites: Trigonometry, MATH 1316, or an equivalent course. You should also have current
algebra skills at the level of MATD 0390, Intermediate Algebra. If you do not have current
knowledge of these topics, then you should ask your instructor about course level changes.


Use of Graphing Utilities: As with any course where either graphing or scientific calculators are
used, the calculator will be used as a supportive tool. This course is not about calculator usage, but
about precalculus concepts. We will use graphing calculators when their use enhances the
understanding of a mathematical idea. Graphing calculators are not required for this course.
However, as you progress through the semester you may find it convenient to purchase your own.
Individual instructors may vary in how often and in what manner they utilize these types of
calculators. 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.

Course Rationale: This course is designed to teach students the algebraic and trigonometric
modeling concepts needed for scientific/engineering calculus. It is not simply a review of college
algebra and trigonometry.

Course objectives: http://www.austinecc.edu/mthdept2/tfcourses/obj2412.htm
COURSE EVALUATION/GRADING SCHEME
Explain grading criteria clearly here. The criteria should specify the number of exams and other graded material (homework, assignments, projects, etc.), with percentage allocation. Instructors should discuss the format and administration of exams. Guidelines for other graded materials, such as homework or projects, should also be included in the syllabus.

COURSE POLICIES
The syllabus should contain the following policies of the instructor:
- Missed exam policy
- Policy about late work (if applicable)
- Class participation expectations
- Reinstatement policy (if applicable)

Attendance Policy (if no attendance policy, students must be told that)
The Math Department's Attendance Policy follows. Instructors who have a different policy are required to state it. "Attendance is required in this course. Students who miss more than 4 classes may be withdrawn."

Withdrawal Policy (including the withdrawal deadline for the semester)
It is the student's responsibility to initiate all withdrawals in this course. The instructor may withdraw students for excessive absence (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.

Incomplete Grade Policy
An incomplete grade (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.

Course-Specific Support Services
Sometimes sections of MATH 0185 (1-0-2) are offered. The lab is designed for students currently registered in Precalculus MATH 2412. 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 that 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 policies are listed in First Day Handout section in front part of the Math Manual. Go to www.austincc.edu/mthdept5/mman06/statements.html. Insert the full statement for each of the following in your syllabus.

Statement on Scholastic Dishonesty

Recommended Statement on Scholastic Dishonesty Penalty

Recommended Statement on Student Discipline

Statement on Students with Disabilities

Statement on Academic Freedo
### Course Outline and Calendar

#### 16-Week Semester

<table>
<thead>
<tr>
<th>Week 1</th>
<th>1.1, 1.2, 1.3, 1.4</th>
</tr>
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<tbody>
<tr>
<td>Week 2</td>
<td>1.5, 1.6, 2.1, 2.2</td>
</tr>
<tr>
<td>Week 3</td>
<td>2.3, 2.4, 2.5, 2.6</td>
</tr>
<tr>
<td>Week 4</td>
<td>Exam #1, 3.1, 3.2</td>
</tr>
<tr>
<td>Week 5</td>
<td>3.3, 3.4, 4.1, 4.2</td>
</tr>
<tr>
<td>Week 6</td>
<td>4.3, (4.4), 5.1, 5.2</td>
</tr>
<tr>
<td>Week 7</td>
<td>5.3, 5.4, 5.5</td>
</tr>
<tr>
<td>Week 8</td>
<td>Exam #2, 6.4, 6.5</td>
</tr>
<tr>
<td>Week 9</td>
<td>6.6, 6.7, 7.2, 7.3 (only identities on bottom of p. 311), 7.4</td>
</tr>
<tr>
<td>Week 10</td>
<td>7.5, (7.6 – Euler’s formula), 10.1, 10.2, (10.3)</td>
</tr>
<tr>
<td>Week 11</td>
<td>8.1, 8.2, 8.3</td>
</tr>
<tr>
<td>Week 12</td>
<td>Exam #3, 9.1, 9.2</td>
</tr>
<tr>
<td>Week 13</td>
<td>9.3, 9.4, 9.5, 9.6, (9.7)</td>
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<tr>
<td>Week 14</td>
<td>11.1, 11.2, 11.3, 11.4</td>
</tr>
<tr>
<td>Week 15</td>
<td>12.1, 12.2, 12.3, 12.4, (12.5)</td>
</tr>
<tr>
<td>Week 16</td>
<td>Exam #4, Review, Optional Comprehensive Exam</td>
</tr>
</tbody>
</table>

#### 11-week Semester

<table>
<thead>
<tr>
<th>Week 1</th>
<th>1.1, 1.2, 1.3, 1.4, 1.5, 1.6</th>
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<tbody>
<tr>
<td>Week 2</td>
<td>2.1, 2.2, 2.3, 2.4, 2.5, 2.6</td>
</tr>
<tr>
<td>Week 3</td>
<td>Exam #1, 3.1, 3.2, 3.3, 3.4</td>
</tr>
<tr>
<td>Week 4</td>
<td>4.1, 4.2, 4.3, (4.4), 5.1, 5.2</td>
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<tr>
<td>Week 5</td>
<td>5.3, 5.4, 5.5, Exam #2</td>
</tr>
<tr>
<td>Week 6</td>
<td>6.4, 6.5, 6.6, 6.7, 7.2</td>
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<tr>
<td>Week 7</td>
<td>7.3 (specific identities), 7.4, 7.5, (7.6), 10.1, 10.2</td>
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<tr>
<td>Week 8</td>
<td>8.1, 8.2, 8.3, Exam #3</td>
</tr>
<tr>
<td>Week 9</td>
<td>9.1, 9.2, 9.3, 9.49.5, 9.6, (9.7)</td>
</tr>
<tr>
<td>Week 10</td>
<td>11.1, 11.2, 11.3, 11.4, 12.1, 12.2</td>
</tr>
<tr>
<td>Week 11</td>
<td>12.3, 12.4, (12.5) Review, Exam #4, Optional Comprehensive Exam</td>
</tr>
</tbody>
</table>

Instructors are encouraged to add a statement, such as “Please note: schedule changes may occur during the semester. Any changes will be announced in class.”

**TESTING CENTER POLICY**

ACC Testing Center policies can be found at: [http://www.austincc.edu/testctr/](http://www.austincc.edu/testctr/)

Instructor will add any personal policy on the use of the testing center.

**STUDENT SERVICES**

The web address for student services is [http://www.austincc.edu/rss/index.htm](http://www.austincc.edu/rss/index.htm)

The ACC student handbook can be found at [http://www.austincc.edu/handbook](http://www.austincc.edu/handbook)

**INSTRUCTIONAL SERVICES**

The web address is [http://www.austincc.edu/faculty/newsemester/](http://www.austincc.edu/faculty/newsemester/), then click on “Campus Based Student Support Overview”.