

**Mathematics for Measurement, MATH 1333
Spring 2011**

Section: 1333.001

Synonym: 24009

Time: MW 5:40 – 7:00 p.m

Classroom: RVS 8131

Office Hours and Office Locations:

MW 4:15 – 5:05 RVS 9119

MW 5:10-5:40 RVS 8131

Email: mparker@austincc.edu**Instructor:** Mary Parker**Phone:** voicemail 522-1281**Course materials:**

www.austincc.edu/mparker

Submit computer work in Blackboard:

http://acconline.austincc.edu

Course Description: A course designed for non-mathematics and non-science majors. Topics include logic, variation, functions, equivalence, congruence, right triangle geometry, and other measurement topics. Prerequisites: A passing score on the mathematics portion of the THEA test or a satisfactory score on the ACC Mathematics Assessment Test or MATD 0360 with a C or better and completion of TSI mathematics requirements.

Required Materials:

1. *Mathematics for Measurement*, version 4, by Mary Parker and Hunter Ellinger. The cost of the textbook is expected to be under \$30.
2. Student Geometry Kit from an office supply store with compass, protractor, drafting triangle (with a 90° angle,) ruler (with both cm. and inches) and a box to keep them in so they don't break or get lost.
3. Scientific calculator with trig functions
4. Graph paper
5. Loose-leaf notebook and at least 30 dividers
6. Device to punch holes so that you can put computer output into your looseleaf notebook.
7. Access to a computer spreadsheet program, in the ACC Learning Lab or at home.
8. Access to ACC's Blackboard and your individual ACC email account.

Instructional Methodology: This is a lecture/discussion course, taught in a computer classroom so that students can sometimes use computer spreadsheet software in class.

Course Rationale: This course is designed to introduce topics of variation in measurement, right-triangle trigonometry, and mathematical modeling for students who won't take higher-level mathematics courses. It satisfies the Core Curriculum requirement for mathematics.

Course Objectives

1. Increase/improve students' quantitative literacy.
2. Understand the innate variation in measured values and the various standard mathematical ways to communicate that variation.
3. Understand the complexities involved with using measured numbers in computations and be able to compute and communicate the resulting variability in the computed values.
4. Provide students with an opportunity to experience connections between geometry and algebra to increase their flexibility and confidence in problem-solving.

Calendar / Testing Schedule:

(See the last two pages of this handout for a tentative daily schedule.)

Weeks 1 – 4: Topics A – I. Review and Introductory Topics.

Weeks 5 – 8: Topics J – O. Includes topics from modeling, trigonometry, and approximate numbers.

Weeks 9 – 12: Topics P – U. Includes topics from modeling, trigonometry, and approximate numbers.

Weeks 13 – 16: Topics V – Z. Includes topics from modeling, trigonometry, and approximate numbers.

There is a test at the end of each of the four parts of the course. The material in the course is cumulative – the later topics use the skills developed in the earlier topics. Thus, all tests are cumulative and cover material from the beginning of the course.

Grading: Each of the four tests counts 18%, the overall quiz/homework grade counts 18%, and attendance counts 10%.

A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: below 60

If you believe that I have made a mistake on grading anything, write a note of explanation on a separate sheet of paper, staple it to the paper, and turn it in for re-grading. I am happy to discuss this with you outside of class, but grades will never be changed or corrected “on the spot”. Such corrections must be made **very soon** after the paper was originally graded. **No grades will be corrected except through this procedure.**

Example: Suppose a student’s four test grades are: 82, 63, 79, 85. This student’s overall quiz/homework grade is 92.5. The student’s attendance grade is 80. Here is the calculation of this student’s grade:

$$\begin{aligned} & 0.18*82 + 0.18*63 + 0.18*79 + 0.18*85 + 0.18*92.5 + 0.10*80 \\ &= 14.76 + 11.34 + 14.22 + 15.3 + 16.65 + 8.0 \\ &= 80.27 \quad \text{which is a course grade of B.} \end{aligned}$$

Attendance Policy: Attendance is required in this course. Students who miss more than 4 classes **may** be withdrawn. A grade is also given for attendance. See below.

Withdrawal Policy: It is the student's responsibility to initiate all withdrawals in this course. The instructor **may** withdraw students for excessive absences, failure to participate in quiz/homework, or failure to progress in the course. “Excessive absences” is defined as four or more absences. “Failure to participate in quiz/homework” is defined as not turning in the weekly assignment for two weeks. “Failure to progress” is defined as having a preliminary daily quiz average of below 50 at any point or making two or more test grades of below 50. The instructor makes **NO COMMITMENT** to withdraw a student for these reasons, but may withdraw a student for any of these reasons.

Before the official census date (during the first two calendar weeks of classes), a withdrawal from this course will take the course entirely off the transcript and no W will appear, so it doesn’t count as a withdrawal. Between then and the final withdrawal date (Spring 2010: Monday, April 25), withdrawals do result in a W on the transcript. After that date, neither the student nor the instructor may initiate a withdrawal.

Students entering a Texas public college or university starting Fall 2007 and later are allowed only a very limited number of withdrawals (i.e. Ws on their transcripts) during their entire undergraduate career. For all students, withdrawals can have negative consequences, including increasing the tuition to be paid when the course is taken again and eligibility for financial aid. Review this and other important information about withdrawals at <http://www.austincc.edu/withdraw/>

Incompletes: 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 have a personal tragedy occur

after the last date to withdraw which prevents course completion on time. An incomplete must be completed promptly or it will turn in to F.

Students with Disabilities: Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request reasonable accommodations through the Office of Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do this three weeks before the start of the semester. Students who are requesting accommodation must provide the instructor with a letter of accommodation from the Office of Students with Disabilities (OSD) at the beginning of the semester. Accommodations can only be made after the instructor receives the letter of accommodation from OSD.

Scholastic Dishonesty: Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to, cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work submitted by students shall be the result of their thought, work, research or self-expression. Academic work is defined as, but not limited to, tests, quizzes, whether taken electronically or on paper; projects, either individual or group; classroom presentations; and homework.

Students who violate the rules concerning scholastic dishonesty will be assessed an academic penalty that the instructor determines is in keeping with the seriousness of the offense. This academic penalty may range from a grade penalty on the particular assignment to an overall grade penalty in the course, including possibly an F in the course. ACC's policy can be found in the Student Handbook under Policies and Procedures or on the web at <http://www.austincc.edu/handbook>

Academic Freedom: Institutions of higher education are conducted for the common good. The common good depends upon a search for truth and upon free expression. In this course the professor and students shall strive to protect free inquiry and the open exchange of facts, ideas, and opinions. Students are free to take exception to views offered in this course and to reserve judgment about debatable issues. Grades will not be affected by personal views. With this freedom comes the responsibility of civility and a respect for a diversity of ideas and opinions. This means that students must take turns speaking, listen to others speak without interruption, and refrain from name-calling or other personal attacks.

Student Discipline: Classroom behavior should support and enhance learning. Behavior that disrupts the learning process will be dealt with appropriately, which may include having the student leave class for the rest of that day. In serious cases, disruptive behavior may lead to a student being withdrawn from the class. ACC's policy on student discipline can be found in the Student Handbook or on the web at <http://www.austincc.edu/handbook/>

Student Services: Classroom behavior should support and enhance learning. Behavior that disrupts the learning process will be dealt with appropriately, which may include having the student leave class for the rest of that day. In serious cases, disruptive behavior may lead to a student being withdrawn from the class. ACC's policy on student discipline can be found in the Student Handbook under Policies and Procedures or on the web at: <http://www.austincc.edu/handbook>

Course-specific support services: ACC main campuses have Learning Labs which offer free first-come first-serve tutoring in mathematics courses. At RVS it is in room 9100. Students should bring their course handouts, notes, and work on the homework when they come to the Learning Lab. For locations, contact information and hours of availability of the Learning Labs, see <http://www.austincc.edu/tutor/>.

Tests.

Some of the tests will be in the Testing Center and some in class.

See this website for locations, hours, and rules for the Testing Center: <http://www.austincc.edu/testctr/>. YOU MUST READ THE RULES on that website and follow those rules when you take a test in the Testing Center. Students who break the rules of the Testing Center are prohibited from using any of the Testing Centers at ACC in any of their classes for the remainder of the semester. The last test will be in class on the last day of class. (You will need your current ACC student ID to use the Testing Center.)

Tests and make-up tests must be done entirely on your own, with no help from anyone else. Violating the rules of the testing center, or giving or receiving help on tests is scholastic dishonesty, and the punishments are severe.

For Tests 1--3, a student who misses a test or who makes below 60 on a test may do make-up work. That make-up work includes re-working all the problems on the test and demonstrating knowledge of these topics in a testing situation. When that work is satisfactorily completed, the test grade will be raised to a 60. Such make-up work can be done on no more than two tests.

All tests in the course are cumulative, as the later material in the course uses the earlier material. That means that students who do poorly at first but learn that early material better later in the course, will not be penalized unduly for the early low grades. At the end of the semester, either or both of the Test 1 and Test 2 grades may be replaced by the average of the Test 3 and Test 4 grades, if that average is higher than the original test grades, as long as the student has either passed Test 1 and Test 2 or done acceptable makeup work for them. In order to be eligible for this, the student must specifically request it on the Test 4 paper. Most students will probably not need this. If, after Test 1 or Test 2, you are failing in the course, please visit with me outside of class about what you will need to do to improve your performance and be eligible for this.

Deadlines for the tests will be enforced very strictly. When the test is in the testing center from Monday through Wednesday, you are expected to take the test on Monday or Tuesday, and then there is an extra day for you to take it late if your car broke down on Tuesday.

Homework:

Homework will be assigned for each topic. Each student is expected to do enough of that homework to learn the material. Students are also expected to check their answers and to mark the homework problems in the margin with a check or X to indicate whether each one is worked correctly or not. The homework for a particular topic should be kept just behind the Topic in the notebook. When we need to discuss your test grades, we will also look in the homework to find similar problems that you have worked correctly.

Daily Quizzes:

Each day a four-problem or five-problem take-home quiz will be assigned, to be turned in at the beginning of class the following class day. Attendance will be recorded from these and a preliminary quiz grade will be recorded. Students are also required to turn in another set of solutions to these quiz problems, organized well and written neatly. Each Wednesday, at the beginning of class, each student must turn in, in a folder, his final set of solutions of the two quizzes ASSIGNED in the PREVIOUS week in one pocket of the folder. In the other pocket of the folder, the student must write a brief summary of what other work he has done in the course for the previous week. That folder will be graded and that gives one weekly quiz/ homework grade. There will be fifteen weekly grades in the class and those will be averaged for an overall weekly grade, which does count in the final course grade.

In those folders, if the student is able to do all the problems on the quizzes correctly and if the brief summary of other work indicates that not much other work was done, that won't lower the weekly grade. Obviously, if a student is not able to do all the problems on the quiz correctly, his summary

should indicate what he is doing to learn the material.

If a student misses turning in a folder in one week, he may turn it in at the beginning of class on the following Monday or Wednesday, with a penalty of 10% for each class day it is late. No credit will be given for weekly folders may be submitted later than that.

Students who miss class may ask another student for the quiz assignment or obtain the quiz assignment for the next day from the course web page at <http://www.austincc.edu/mparker/1333/>. Students who miss class should come to my office hours very soon to ask their questions over the homework or to get any materials that were handed back during the class.

Students who are late for class must bring their quiz to the front when they come in. If a folder is to be turned in that day, bring it also.

A student who attends class but has not worked any of the quiz problems for the day must turn in a signed piece of paper along with the stack of quizzes in order to earn credit for attendance that day.

A student who misses class will be considered to have an excused absence of these two conditions are met. This can only be done 4 times during the semester. These, then, do not count as absences in the attendance grade.

1. The quiz for that day is submitted electronically through the Blackboard Digital DropBox before time for the class to begin and is at least 80% correct. You can just type your answers on a page and bring the work later. It is possible that other forms of submission before the class begins will be accepted, but that must be discussed in advance.
2. The student attends the next class and the quiz for that class is submitted at that time and is at least 80% correct.

These, then, do not count as absences in the attendance grade.

Attendance grades:

Attendance will be recorded from the quiz papers submitted.

A student with 0, 1, or 2 absences during the semester will earn 100%. Every absence after that will decrease the attendance grade by 10%. Students who come late to class or leave early (more than 5 minutes either way) will be counted absent. Some modification of that may be allowed after some discussion about that particular incident, but discussion of that must be in the same week as that class. A summary of the preliminary daily quiz grades will be maintained. If, at any point, the average of those preliminary daily quiz grades falls below 50, the student may be withdrawn for failure to progress in the course.

Organization of Materials

I have found that there is a strong relationship between how organized a student keeps his course materials and work in the course and how well he learns the material. So I am requiring you to organize your materials in the following way.

1. Use a looseleaf notebook with about 30 tabbed dividers. Use notebook paper with holes so that the individual pages can be inserted into the looseleaf notebook. Here are the various sections of the notebook that should be separated by dividers.
 - Daily handouts and class notes.
 - Quiz problem that is due next time. (Blank notebook paper to do the quiz on.)
 - Old quizzes that have been returned. (Maybe you will want a divider with a pocket or an envelope so that you can just slip the papers in it.)
 - Homework cover sheet(s)
 - Printed Topic A and blank notebook paper for working these homework problems.
 - Printed Topic B and blank notebook paper for working these homework problems.

- Printed Topic C and blank notebook paper for working these homework problems.
 - etc. (through Topic Z)
2. Your class notes should have the date on each page, and the printed daily handout and the class notes for that day should be together to make a “package” for that day. Then put those packages in order by date. (I keep the most recent on top, but it’s also OK to keep the most recent at the back. Just make sure they are in order.)
 3. If your notebook gets larger than you want to carry with you each day, then get a second looseleaf notebook to leave at home. Keep about three weeks worth of the current material in the notebook you take to class, and leave the older material in the notebook at home, but still organized as described, with the dividers.
 4. If you miss a class, go to the course webpage and print the daily handout for the day you missed and add it to your notebook in the correct place. And do the quiz to turn in at the next class meeting.

Class Rules:

1. In accordance with school policy, you may not bring food or drink into class.
2. Please turn off or mute volume on beepers and cellular phones so as not to disrupt class.
3. Arrive for class a few minutes early so that you can have your materials out and be ready to start class on time.
4. Disruptive behavior (talking to others while I am lecturing, rudeness, etc.) will not be tolerated.
5. Class discussion will focus on the material being presented and will be about matters relevant to the entire class. Discussion of your individual situation belongs in office hours or, occasionally, in the part of the class time that I have identified as devoted to working individually with students.
6. Children are not allowed to attend class with you.
7. Remember you are here to learn; be prepared to participate in class discussion. We are all unique individuals and in this class everyone's opinion will be respected whether we agree or disagree.
8. Counseling services are available to help you with a variety of needs, if you would like more information please ask.
9. Office hours are before class, but I am also available for a short time after class. Ask immediately if you need help! I am here to help you learn. Getting behind even one day will cause you to be confused and frustrated.
10. Quiz problems will never be accepted late. A moderate amount of extra credit is available to everyone.
11. Tests may not be taken late. There is a provision for making up low test grades and that will be used to deal with a missing test grade.
12. All students must take the final exam at the scheduled time. There are no exceptions.
13. If you enroll in the class late, you are subject to the same rules as students who enrolled in the class before the class began. The standard grading scheme allows enough flexibility for all students to make up a reasonable number of absences.
14. Cheating will not be tolerated.

Tentative schedule of topics to be covered in each class

There may be some changes in the exact days as we go through the semester.

The material in the course is cumulative – the later topics use the skills developed in the earlier topics. Thus, all four tests are cumulative and cover material from the beginning of the course. Plan to take the Testing Center portions of the tests:

- Test 1 about Feb 11 for the Testing Center portion
- Test 2 about March 11 for the Testing Center portion
- Test 3 about April 15 for the Testing Center portion
- Test 4 **in class** on May 11

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| day 1 | Jan 19 | Algebra review, graphing review, rounding review. Topics A, B, and D |
| day 2 | Jan 24 | Spreadsheet, more on rounding. Topics C and D |
| day 3 | Jan 26 | One more problem each on spreadsheet, rounding, and algebra. Look over calculator review. Starting linear formulas. New: Topics E and G |
| day 4 | Jan 31 | Linear equations and formulas Topics G, H. Finish Topics A-D. |
| day 5 | Feb 2 | More on word problems and spreadsheets Finish Topics A-E, G-H |
| day 6 | Feb 7 | Data. Topic I |
| day 7 | Feb 9 | Wrap-up of Test 1 material (both Testing Center part and spreadsheet part) Start constructing diagrams. Topic F |
| day 8 | Feb 14 | Constructing Diagrams. Topic F |
| day 9 | Feb 16 | Spreadsheet test problem, intro to topics J and K. (Demonstrate spreadsheet work on these topics.) |
| day 10 | Feb 21 | Starting to analyze data: Measuring variability on one variable with standard deviation (Topic J) For bivariate data, fitting linear and quadratic models (Topic K) |
| day 11 | Feb 23 | Calibration (Topic J) and starting trigonometry (Topic L) |
| day 12 | Feb 28 | Calibration Drift (Topic J) and more trig (Topic M) |
| day 13 | Mar 2 | Communication (Topic N) and Input sensitivity (Topic O) |
| day 14 | Mar 7 | Wrap-up of material for Test 2 (both Testing Center part and spreadsheet part) |
| day 15 | Mar 9 | More review and take spreadsheet portion of Test 2. |
| day 16 | Mar 21 | Review of trig and Topic Q: trig on angle outside 0 to 90 degrees. |
| day 17 | Mar 23 | Modeling with Exponential formulas. Topic P |
| day 18 | Mar 28 | Solving general triangles. Topic R |
| day 19 | Mar 30 | Solving general triangles. Topic R |
| day 20 | Apr 4 | Automating solutions to fitting models. Topic S |
| day 21 | Apr 6 | Assessment of the fit of a model. Topic S |
| day 22 | Apr 11 | Review of Topics R and S, leading into Topic V, which involves constructing a spreadsheet workbook to solve triangle problems. |
| day 23 | Apr 13 | Wrap-up of material for Test 3. (both Testing Center part and spreadsheet part) Work on trig spreadsheet workbook. Topic V |

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| day 24 | Apr 18 | Spreadsheet portion of Test 3 and work more on trig spreadsheet workbook. |
| day 25 | Apr 20 | Reducing noise by averaging. Topic X |
| day 26 | Apr 25 | Modeling: Using semi-log and log-log graphs to assess the type of model to apply. Topic U |
| day 27 | Apr 27 | Use trig workbook and finish Topic X |
| day 28 | May 2 | Approximate numbers and noise propagation with single input. Topic Z1 |
| day 29 | May 4 | Noise propagation with multiple inputs. Topic Z2. |
| day 30 | May 9 | No new material |
| day 31 | May 11 | Test 4 in class |