Syllabus for: (name of class)	Math 25 *College Trigonometry*	
Semester & Year:	Spring 2014	
Course ID and Section Number:	Math 25-E5152	Math 25-E5600 "Hybrid"
Number of Credits/Units:	4 units	
Day/Time: **Location:**	MW 6:05-**8:10pm** (E5152) Room SC204.	MW 6:05-**7:30pm** (E5600 "Hybrid"), SC 204; with additional Days TBA, Times TBA, Room TBA
Instructor's Name:	Teresa "Tami" Matsumoto	
Contact Information:	Office location and hours: SC 205-B, Eureka Campus; M 3:30-4:30, TWThF 1:30-2:30 Phone: (707)476-4543, Fax: (707)476-4424 Email: tami-matsumoto@redwoods.edu	

Course Description (catalog description as described in course outline): A study of trigonometric functions, radian measure, solution of right triangles, graphs of the trigonometric functions, inverse trigonometric functions, trigonometric identities and equations, laws of sines and cosines, solution of oblique triangles, polar coordinates, complex numbers in trigonometric form, De Moivre's theorem, and conic sections.   *Note: A graphing calculator is required.*

Student Learning Outcomes (as described in course outline) :
1.   Analyze and solve problems involving trigonometric functions or analytic geometry.
2.   Apply the mathematics of trigonometric functions and analytic geometry to real-world problems and applications.
3.   Use graphing technology to visualize trigonometric and polar curves, explore mathematical concepts, and verify results.
4.   Write solutions to mathematical exercises in trigonometry and analytic geometry using sound mathematical reasoning with appropriate use of numerical, graphical, and symbolic representations.

Special accommodations: College of the Redwoods complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request at least one week before the first test so that necessary arrangements can be made. No last-minute arrangements or post-test adjustments will be made. If you have a disability or believe you might benefit from disability related services and may need accommodations, please see me or contact Disabled Students Programs and Services. Students may make requests for alternative media by contacting DSPS.

Academic Misconduct: Cheating, plagiarism, collusion, abuse of resource materials, computer misuse, fabrication or falsification, multiple submissions, complicity in academic misconduct, and/ or bearing false witness will not be tolerated. Violations will be dealt with according to the procedures and sanctions proscribed by the College of the Redwoods. Students caught plagiarizing or cheating on exams will receive an "F" in the course.

The student code of conduct is available on the College of the Redwoods website at: http://redwoods.edu/District/Board/New/Chapter5/AP%205500%20Conduct%20Code%20final%2002-07-2012.pdf

Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the college catalog and on the College of the Redwoods homepage.

College of the Redwoods is committed to equal opportunity in employment, admission to the college, and in the conduct of all of its programs and activities.

Math 25 Trigonometry (E5152 and E5600)

Information follows in these sections:

1. About Trigonometry
2. Course Structure
3. Materials you will need
4. Policies
5. Schedule
6. Course Content
7. Assignments
8. Guidelines for Written Assignments
9. Your Own Personal Trigonometry REFERENCE BOOK

1. About Trigonometry

This course, Math 25 College Trigonometry is a transfer-level math course needed for preparation for calculus. Math 25 and Math 30 (College Algebra) together constitute what is often referred to as "Precalculus" and both courses are required prerequisites for Math 50A Calculus.

Trig·o·nom·e·try (trigəˈnämitrē/)
(from Greek *trigōnon*, "triangle" + *metron*, "measure")
Noun 1. a branch of mathematics dealing with the relations of the sides and
angles of triangles and with the relevant functions of any angles.

We will study six trigonometric functions. Understanding how functions work is critical for success in this course. Students who have already had Math 30 College Algebra (or some similar course) have an advantage in that they have more experience working more deeply with functions and function behavior. Students who have yet to take Math 30 College Algebra (or some other pre-calculus course) will have an advantage after completing this course because they will be starting that other course with more experience with different kinds of functions.

In this course, you will need to learn (a la Bloom):

- Knowledge
  - Definitions
  - Types of Graphs
  - Different Formulas
  - Main Ideas
- Comprehension
  - How related things compare (similarities, differences)
  - Relationships among different trig functions
  - How to manipulate trig functions in expressions and equations
- Application
  - How to apply what you know to real-life situations
  - How to make good use of information
  - How to solve problems, combining together what you have learned
- Analysis
  - How to make inferences from analysis of complex information
  - Recognizing importance and significance of component parts
- Synthesis
  - How to understand a situation and pull together all that you have learned
- Evaluation
  - How to look back to assess what was done (by you or others) and evaluate the results

2. Course Structure

"*HYBRID*" and "Non-Hybrid" sections together: One section is called "hybrid" because it is partly like a regular class, and partly online. This section has two class meetings every week, so you do get SOME lecture and "face time" with the instructor, but the class meetings are shorter than in a "traditional" Math 25 class. The way we scheduled it, the "hybrid" class overlaps with the "non-hybrid" class, so at 7:30, the "hybrid" class is over. In the rest of the class session for the other class (40 minutes), we will not cover any **new** material, but will have more time for questions and examples. Exams, when given in the non-hybrid class, will be during that last 40 minutes. "Hybrid" students are welcome to stay during the last 40 minutes, any time.

Course Structure
- You study the material in the text (which is organized into 9 learning units).
- You attend class sessions, and you do homework (part in the textbook, and part online "pretest" homework assignments).
- Each unit has a Unit Exam. "Hybrid" students take the Unit Exams in the ASC, online and proctored, outside of class meeting time, and must do that by the deadline for that unit. "Non-Hybrid" students will have exams on paper during class time.

3. Materials you will need:
- **Required Text**: *Algebra & Trigonometry*,
  by Michael Sullivan, published by Prentice Hall
  (6th or 7th or 8th edition).
  This book is used in both Math 25 and Math 30. A limited number of textbooks are available at the CR library and can be checked out for the entire semester. The textbook can also be purchased very inexpensively from various online book sellers.
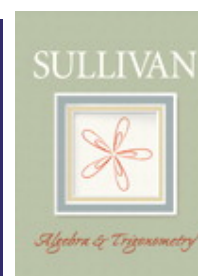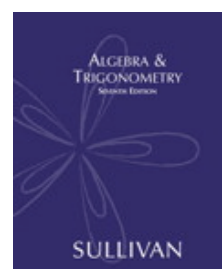
- **Bound Notebook with Grid Paper**:
  Roaring Spring #77475 or Ampad #26-251 (about $2 - $6), for example. Make sure it is **bound** and has **graph paper** in it. You will use this throughout the course to build yourself a reference book (see the "Reference Book Information" handout also).

- **Time. Lots!!** In your own weekly schedule please make sure that you have blocked out at least 15 hours *(possibly as much as 20 hours)*, per week, to devote to this class.

- **An Email Account and Access to the Internet**. I expect you to have access to a computer and expect to be able to contact you easily.

- **Calculator**: A *Graphing* Calculator (TI-83 or TI-84 recommended). On the Eureka campus, a limited number of rental calculators are available from the Math Lab in the ASC.

- **Paper**:   Homework Paper and scratch paper, lots of it! It is fine with me if you RE-USE paper. Paper that's only been used on one side is still fine (in general) on the other side. You will also need some graph paper. Get it in a pad or a package of loose-leaf sheets (rather than stuck in a notebook), or print it from the web. Many people find it helpful to get graph paper with heavier lines on every fifth line to make counting easier.

- **Pencils**:   Lots. Math problems should be done in pencil in this class (as in math classes in general). If you like softer lead (I find it writes darker easier) then you might like "2B" mechanical pencil lead (I prefer "2B" to "HB" which I find not as easy to work with).
- **Erasers**:   At least one.
- **A ruler**:   Important for drawing graphs carefully and correctly.

Mathematics Department Policy Regarding "Faculty Withdrawal" of Students after Census Day: A student who is absent from class for the amount of time equal to two weeks of classes can be withdrawn from the course, unless there are extenuating circumstances that are communicated to the instructor in a timely manner. This "faculty withdrawal" can occur between Week 4 and Week 10 of the semester.

HELP?! If you have questions, please get help! It is *your* responsibility to seek help if you need it. I will answer some questions in class, but unfortunately, we will not have enough time to answer all of everyone's questions.

Course Grading: Your final course grade will be determined by a combination of point totals in the course and the professional judgment of the instructor. Plusses and minuses will be assigned where appropriate. The tentative approximate weighting for the course is:

Textbook: Reading, Problems, Reference Book	10%
Other assignments , including "Written Assignments"	10%
Online Homework (including "Pretests")	20%
Unit Exams (9 of them)	35%
Mid-term (aka "Trig Final")	15%
Final Exam (aka "A.G. Final")	10%

Approximate Grade cutoffs:

A or A-	Guaranteed for 85% and above
B- (or better)	Guaranteed for at least 72%
C- (or better)	Guaranteed for at least 60%
D (or better)	Guaranteed for at least 50%

CAVEAT: The above procedures are subject to change.

5. Schedule – Math 25 E5600/E5152 – College of the Redwoods – Spring 2014

Week#	Monday	Tue	Wednesday	Thu	Fri
1	Jan 20 — CR / HSU Holiday (MLK Jr)	Jan 21 — CR Math Classes Begin	Jan 22 **[UNIT 1]** Introduction • Right Triangle Definitions • Radians, Degrees	Jan 23	Jan 24
2	Jan 27 **[UNIT 1]** • Angle Conversions • Arcs, Sectors • Rt Triangle IDs	Jan 28	Jan 29 **[UNIT 1]** • Circular Motion • Exact values; Calculator	Jan 30	Jan 31 *Deadline: Drop w/o "W" &* **Unit 1 TARGET**
3	Feb 3 CENSUS DAY **[UNIT 2]** • General Angles	Feb 4 **Unit 1 Deadline**	Feb 5 **[UNIT 2]** • Unit Circle	Feb 6	Feb 7
4	Feb 10 **[UNIT 2]** • Right Triangle Applications	Feb 11 **Unit 2 TARGET**	Feb 12 **[UNIT 3]** • sine ,cosine graphs • Graphs & Transformations	Feb 13 **Unit 2 Deadline**	Feb 14 — No Classes (Lincoln)
5	Feb 17 — CR Holiday (Washington)	Feb 18	Feb 19 **[UNIT 3]** • Phase Shift • Simple Harmonic Motion	Feb 20	Feb 21 **Unit 3 TARGET**
6	Feb 24 **[UNIT 4]** • tan,cot,sec,csc graphs • Review Inverse Fns	Feb 25 **Unit 3 Deadline**	Feb 26 **[UNIT 4]** • Inverse Trig Functions	Feb 27	Feb 28 **Unit 4 TARGET**
7	Mar 3 **[UNIT 5]** • Trig IDs • Intro Sum & Diff Formulas	Mar 4 **Unit 4 Deadline**	Mar 5 **[UNIT 5]** • Sum & Diff Formulas • Dbl, Half-angle formulas	Mar 6 *Deadline: Petition to Graduate*	Mar 7
8 DST*	Mar 10 **[UNIT 5]** • Product-to-Sum • Sum-to-Product	Mar 11 **Unit 5 TARGET**	Mar 12 **[UNIT 6]** • Trig Equations	Mar 13	Mar 14 *π Day!* **U 5 Deadline**
Spr Brk	Mar 17	Mar 18	Mar 19	Mar 20	Mar 21 — Mar 22
9	Mar 24 **[UNIT 6]** • Law of Sines • Law of Cosines	Mar 25	Mar 26 **[UNIT 6]** • Ambiguous Case • Areas of Triangles	Mar 27	Mar 28 **Unit 6 TARGET**
10	Mar 31 (HSU Holiday) *Cesar Chavez Day* • **REVIEW for Midterm: Units 1-6**	Apr 1 **Unit 6 Deadline**	Apr 2 • **REVIEW for Midterm: Units 1-6**	Apr 3	Apr 4 *W/Draw Deadline* **MT TARGET** — Apr 5 Humboldt Math Festival
11	Apr 7 **[UNIT 7]** • Review Complex Numbers • Polar Coordinates • Complex in Polar Form	Apr 8 **MT Deadline**	Apr 9 **[UNIT 7]** • Complex Polar, DeMoivres Powers	Apr 10	Apr 11
12	Apr 14 **[UNIT 7]** • Complex Polar, DeMoivres Roots	Apr 15 **Unit 7 TARGET**	Apr 16 **[UNIT 8]** • Parabolas, Ellipses, Hyperbolas intro	Apr 17	Apr 18 **Unit 7 Deadline**
13 20th Easter	Apr 21 **[UNIT 8]** • Parabolas, Ellipses, Hyperbolas details	Apr 22	Apr 23 **[UNIT 8]** • Applications	Apr 24	Apr 25 **Unit 8 TARGET**
14	Apr 28 **[UNIT 9]** • Translations	Apr 29 **Unit 8 Deadline**	Apr 30 **[UNIT 9]** • Rotation	May 1	May 2
15	May 5 **[UNIT 9]** • Rotation	May 6 **Unit 9 TARGET**	May 7 • **REVIEW for FINAL**	May 8	May 9 *Eureka MSE BBQ (tent.)*
CR/HSU FINALS WEEK	May 12 **REVIEW for FINAL**	May 13 **Unit 9 Deadline**	May 14 **Final TARGET**	May 15	May 16 **Final Deadline** — May 17 CR Eur Commenc

6. Course Content: Brief Descriptions of Math 25 Units

Unit	Brief Description
1	**Angles; Trigonometric Functions defined using Right Triangles** • Unit 1 begins with a discussion of angles and various ways to measure angles: radians, decimal degrees, and degrees-minutes-seconds. You are probably familiar with degrees, but in mathematics it is more convenient to use radians. You will also learn to convert between the three measurements. • The six trigonometric functions are then defined in terms of right triangles (in Unit 2, you will learn a second approach to the definition in terms of the unit circle). You will also learn how to compute the exact values of these functions at certain angles, and approximations at more general angles. It is Math Department policy that students should be able to compute the exact values of all the circular (trigonometric) functions at the "standard" angles, i.e., all multiples of pi/6 and pi/4 radians and 30 and 45 degrees. • Finally, you will also learn some of the basic identities that are satisfied by the trigonometric functions.
2	**Trigonometric functions generalized beyond right triangles; applications involving right triangles** • The first part of Unit 2 continues the development of the trigonometric functions by studying their values at general angles. First, these values are computed by using the reference triangle technique. Then an alternative approach, using the unit circle, is given. In fact, this actually provides a second alternative definition of the trigonometric functions. It is very important that you learn both approaches to the definition and calculation of trigonometric functions. • In the second part of Unit 2, you will see how trigonometry can be used to solve a large variety of applications involving right triangles.
3	**Graphs of Sine and Cosine Functions; Simple Harmonic Motion** In this unit, you will study the basic properties of the graphs of the sine and cosine functions, with variations. You will also apply your knowledge of these to various spring problems.
4	**Graphs of all Trigonometric Functions; Graphs of some Inverse functions** In this unit, you will study the graphs of tangent, cotangent, secant, and cosecant, with variations. You will also study the inverse trigonometric functions. The textbook is quite brief in these three sections, so supplementary material and exercises areincluded.
5	**Fundamental Trigonometric Identities** In this unit you will learn more about the trigonometric functions. In order to use them for solving real-world problems, you need to know more about their relationships with each other through the various trigonometric identities.
6	**More Trigonometric Identities; Applications involving triangles that are not right triangles** This unit consists of two parts. • The first part finishes the study of trigonometric identities begun in Unit 5. In this section you will use the various trigonometric identities to help solve equations involving trigonometric functions. • The second part is a study of methods for solving general triangles, using the Law of Sines and the Law of Cosines. Included are many different applications, along with a short section on two new formulas for the area of a triangle.
Trig Final	**TRIGONOMETRY FINAL EXAM** Material covered: All Material from Units 1 through 6.
7	**Polar Coordinates; Polar Equations; Complex Numbers** The Analytic Geometry section of the course begins with this unit, which consists of two parts. • The first is an introduction to polar coordinates for points in the xy-plane, and polar equations and their graphs. • The second is a study of complex numbers. The two topics are related by the polar form of a complex number, which then leads to simple formulas for finding powers and roots of complex number via DeMoivre's Theorem.
8	**Conic Sections (Standard position)** This unit begins our study of the conic sections: parabolas, ellipses, and hyperbolas. We will only consider conics in standard position (parabolas with vertex at the origin, ellipses and hyperbolas with center at the origin), and in standard orientation in this unit. We will study translated conics and rotated conics in Unit 9.
9	**Conic Sections (translated and/or rotated); parametric equations** In this unit, we continue our study of the conic sections with investigations on translation and rotation of axes.
A.G. Final	**ANALYTIC GEOMETRY FINAL EXAM** Material covered: Primarily material from Units 7, 8, 9.

7. ASSIGNMENTS -- *What exactly do you have to do?*

1. **Textbook and Reference Book (10%)**
   Reading and Problems – For each Learning Unit, read the description and instructions – **This tells you which pages in the text to read** and **which problems in the book to do**. Your work on the textbook problems is to be turned in at the time of the Unit Exam and will be looked over quickly. You must verify the answers yourself – but doing them is an essential part of the process by which you learn the material. It is recommended that you work through examples in the text as you read through it, and work additional problems that are not assigned. The CD-ROM that comes with the text (7th edition) has good examples to view while you are reading and learning from the text.

   Reference Book – **You will create a "Reference Book"** throughout the course. Bring it to class regularly (especially for "Reference Book Quizzes") and it will be graded throughout the term. See the "Reference Book" handout for specific directions.

2. **Other Assignments (10%)** Some assignments will be different from problems in the book. Some may be explained on handouts, some may be discussion board assignments, some will be brief quizzes. Some will be in class without notes (not necessarily announced ahead of time), some will be "***Reference Book Quizzes***" on which you will be allowed to consult your own personal Reference Book, and some will be online.

   Written Assignments – In addition to the assigned textbook problems (which will be collected but not graded), for each unit, there will be a short written assignment to turn in – these WILL be GRADED. The point of these **very short** assignments is to get practice **writing** mathematics correctly. This is the only time I will grade your written work carefully, so you must take great care with these short assignments to write them out clearly and correctly. You will be given specific guidelines for these so that you know what you are expected to do. These can be redone and resubmitted.

3. **Pretest/Homework (20%)** –

"Hybrid" Section: Each unit has a "**Pretest/HW**" assignment in the "Optimath" Online Testing System. For each unit, you should do the "Pretest/HW" assignment more than once (at least three or four times). Your *highest* scores on these assignments count as part of your course grade.	"Regular" Section: Each unit will have designated homework that will count for this grade – some will be on Optimath, some will be from the text. The Optimath assignments can be done more than once. The highest score counts toward your course grade.

   [NOTE: "Optimath" **PRACTICE** assignments do not count directly toward your grade like the **Pretest/HW** assignments do.]

4. **Exams (online, in ASC)**

"Hybrid" Section: Exams will be taken online, in a proctored environment, in the ASC. N.B. *Exams done online during class meeting time will not count for credit* – if you take an exam while we are in class, your score will be 0	"Regular" Section: Exams will be done on paper and will be taken in class, unless there is a take-home exam, or a take-home portion of an exam.

   Unit Exams (35%) – For each Unit, there is a Unit Exam which must be taken by the Unit deadline. [Note for "Hybrid" Section: Unit Exams can be taken more than once, but **NOT on the same day** for the same unit. Prepare to take the Unit Exam by or around the Unit "Target Date" – then you still have a couple days before the Unit deadline to re-take the Unit Exam if you wish. (allowed *once* each day). You are allowed an hour for each Unit Exam (but allow a little more time in your schedule in case of technical difficulties).

   - **Midterm Exam, aka "Trig Final" (15%)** – After Unit 6, there is a Midterm covering all material from Units 1 through 6. [Note for "Hybrid" Section: Like Unit Exams, you must take this in the ASC, but unlike Unit Exams there is no "pretest" that is exactly like this, and you are allowed to take the Midterm only two times at most. You are allowed two hours for the Midterm.]
   - **Final Exam, aka "A.G. Final" (10%)** – After Unit 9, there is a Final Exam for this course which must be taken by the end of Finals Week. It will focus on material in Units 7, 8, and 9. [Note for "Hybrid" Section: As with the Midterm, you take this in the ASC, you are allowed to take the Final two times at most, and you will get two hours in which to do it.]

8. Guidelines for Written Assignments (in general):

1.   Use pencil.

2.   Write neatly and legibly, using one side of the paper.

3.   Work down the page (not across in paragraph-type form) like you usually see in texts.

4.   On your paper, state the problem clearly.

5.   On your paper, state your answer clearly in a manner appropriate to the context.

6.   Write equivalent equations clearly, when appropriate, rather than loose expressions.

7.   Show each step clearly (no big mystery jumps).

8.   Do *not* use equal signs where things are not really equal.

9.   **Do** use equal signs to show equality appropriately.

10.   Use variables correctly. For instance, do not change the case of a variable. Also if you are using a substitution, do not use the same variable in a different way (e.g. substituting $\sqrt{x}$ with u is OK, but it is NOT OK to substitute $\sqrt{x}$ by using x).

11.   Notation: Be careful to use correct symbols, and to make them the right size (e.g., make fraction bars and radical symbols large or long enough to include all that should be included).

12.   Marks showing things like canceling must be correct. That is, if you read an equation *before* the marks *and after* the marks, the equation should still be true.

13.   Use units throughout the problem, when they apply.

14.   Make a good sketch of a graph or diagram, when applicable. Use a ruler to make straight lines. Indicate pertinent features (use color), and label axes and lines.

15.   Check your answer and show that your answer is correct.

16.   Reflect on the problem. For example, consider whether your answer seems appropriate (not just that it is mathematically correct), and look back over your work to see what worked well or if you might have done something differently. Learn from this experience what is good and what could be better, to help you do future problems. After you give it some thought, write down your reflection(s), and include that when you turn in the assignment.

9. Your Own Personal Trigonometry REFERENCE BOOK

> *During the term, you will create your own personal Trigonometry Reference Book. In your Reference Book, you will write definitions, graphs, examples, and instructions of things that you learn in this class. This book will be useful to you throughout this course, and especially in math courses you take after this one!*

You will be allowed to use your Reference Book on our "Reference Book Quizzes" as well as when you are studying and working on your homework.

- **Get a bound notebook with grid paper** in it (sometimes called "quad ruled").   Composition books are about $2 to $4 dollars and are sold at the CR bookstore, Staples, and other places.

- **Make a Title Page**. The first page should be made into a title page. Create a title for your book, and include identifying information so it could be returned to you if you ever were to lose it.

- **Start the Table of Contents**. On the top of the next page (right side) write "Table of Contents" and reserve *the next several pages* for your Table of Contents to grow into. Skip at least 4 pages – more if your writing is large or if you anticipate entering particularly detailed information in your "T O C."

- **Page 1**. The first page that you write actual content information on should be numbered "1".

- **Number the following pages**. Number the pages, either odd and even on front and back, or you might prefer to number just the right-side pages 1, 2, 3, and so on, leaving the left sides blank at first.

- **Enter information regularly as you study and do your homework**. Keep just one basic topic on each page, even if you don't fill up every page. The important thing to remember is to make this useful for yourself, so that a year from now (for example), you will be able to find whatever you look for easily.

- **What to write**: At times, I will direct you to include specific information in your Reference Book. Also, as you study, go over your class notes and read corresponding material in the text, synthesize important information and put it into your Reference Book. Definitions and explanations *in your own words* will be easier for you to understand later. Include examples and pictures, too.