MATH 125-035:
PLANE TRIGONOMETRY

Revised Summer 2003

3 Semester Hours Credit

Author and Instructor: William Blubaugh, Ph.D.

8 Lessons
Proctored Mid-Course & Final Tests

Office of Extended Studies
University of Northern Colorado
Greeley, Colorado 80639
Greeley (970) 351-2944 or Denver (303) 637-4320
Toll free 1-800-232-1749
Fax (970) 351-2519
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Test Request Forms
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Course Evaluation
Welcome to Plane Trigonometry and to Independent Study. Before you begin, I would like to share a little about myself.

I completed a Bachelor of Science Degree in Mathematics and Science at Kent State University in northeastern Ohio and a Master of Science, also from Kent State University, in Mathematics and Education. In 1984, I received a Ph.D. in Mathematics Education from the University of Colorado at Boulder. My professional experience includes ten years of teaching at the high school level in basic mathematics through calculus, two years of teaching mathematics education at the University of Colorado at Boulder as a graduate student, three years of teaching mathematics education at the University of Texas at Austin, and fourteen years of teaching mathematics and mathematics education courses at the University of Northern Colorado.

I have enjoyed teaching algebra to high school and college students in the classroom and working with students, similar to yourself, who have elected to complete algebra by independent study. I enjoy writing and have authored several articles for Mathematics Teacher, School Science and Mathematics, and Mathematics and Computer.
**Education.** I have presented at state, regional, and national conferences for various professional and learned societies.

My wife, Karen, and I have been married eighteen years and we have three children. Cathy is 16, Becky is 14, and Matthew is 12. We especially enjoy hiking, camping, and skiing in the mountains.

Feel free to contact me at any time by phone (Office: 970-351-2028, Home: 970-667-8793), fax (970-351-1225), email (William.Blubaugh@unco.edu), or the web (http://hopper.unco.edu/faculty/personal/blubaugh.htm).

### INFORMATION SPECIFIC TO THIS COURSE

<table>
<thead>
<tr>
<th>COURSE NUMBER AND PREFIX:</th>
<th>MATH 125-035</th>
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</thead>
<tbody>
<tr>
<td>TITLE AND CREDIT:</td>
<td>Plane Trigonometry (3 sem. hrs.)</td>
</tr>
<tr>
<td>COURSE DESCRIPTION:</td>
<td>You will study trigonometry functions, their graphs, their applications, right triangle ratios, identities, inverse trigonometric functions, vectors and complex numbers through Demoivre’s Theorem and the nth-Root Theorem.</td>
</tr>
<tr>
<td>PREREQUISITES:</td>
<td>The prerequisite for this course is successful completion of college algebra or two years of high school algebra.</td>
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<tr>
<td>COURSE OBJECTIVE:</td>
<td>The objective of the course is to prepare you to use the language of trigonometry. By the word “language,” I mean that trigonometry uses symbols to express ideas; thus, the purpose of the course is to assist you in learning how to read, write and apply trigonometric ideas and problem solving.</td>
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<tr>
<td>OTHER COURSE MATERIALS:</td>
<td>Graphing Paper and a Graphics Calculator are Needed</td>
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PROCEDURE: When you have finished the reading assignment for the unit, complete the homework assignment. Fill out and attach a Blue Sheet to your work and mail the assignment to the following address:

Office of Extended Studies
University of Northern Colorado
Greeley, CO  80639

DO NOT MAIL YOUR HOMEWORK DIRECTLY TO ME!

Your assignment will be graded and returned to you.

If you were taking this course on a college campus, you would spend three hours in class each week for fifteen weeks, and I would assume that you were studying about two hours outside of class for each hour in class. Therefore, you should plan to spend about 135 hours of actual study time on this course building your skills and completing practice problems and your homework assignments.

Please show all your work on the problems you submit for grading. I will be able to better assess your work and will possibly award partial credit.

Please use a pencil that writes dark enough so that I can read your work easily.

As in practicing to play a musical instrument, the more exercises or practice you do, the more skill you will develop; so, don’t limit your practice to just those exercises which are to be submitted for evaluation. Note that your text provides answers for all of the odd-numbered exercises of each section, and all answers for the Chapter Tests and Cumulative Reviews. Your assigned problems all have even numbers. Take the time to work numerous odd-numbered exercises. You can look up the correct answer and continue to work the problem until you get the right answer. This will help you build your skills and your confidence for successfully completing the homework assignments. The answers provided for the odd-numbered exercises and the worked examples in the text should
provide you with the format I expect you to use for the work that you will submit for evaluation. Please pay careful attention to this format.

You will be studying Appendix I, Chapters 1 through 7 in the textbook for this particular course. The use of calculators is emphasized throughout the text. While the graphing calculator is a powerful tool utilizing the best of current technology, it is not necessary, and not required, for you to have a graphing calculator to complete this course. However, you do need a good scientific calculator - one which is capable of evaluating trigonometric, exponential, and logarithmic functions, and displaying results in scientific notation (all features of which are contained within a graphics calculator). You are, of course, welcome to using a graphics calculator if you like; in fact, if you are going on to other mathematics or science courses, use of a graphics calculator would be a good idea. However, the text - and the course - are accessible to those who will not continue in mathematics.

The secret of success in this course is diligence in doing as many exercises as possible and careful attention to accuracy. I expect the work you submit for grading to be neat and easy to read, and that it will follow the format provided in the examples in your text.

If you have any questions for me, write them on a separate sheet of paper and clip or staple your questions to the first page of your written work.

Staple each unit separately.

Be sure your name is on each page of your written work and your Social Security Number and address are included on the Blue Sheet.

Make a copy of your written work to save as a back-up in case an assignment is lost in the mail. The university cannot be responsible for your work should this happen, and occasionally it does.

You are responsible for the postage necessary to mail your homework to the university for grading.
Along with your first assignment, please write a short paragraph about yourself, explaining why you have chosen to take this course, your educational background, and anything else you might share with an instructor and the class if you were taking this course in a regular classroom setting.

When you have completed the course, please take the time to complete the course evaluation included in this syllabus. A self-addressed envelope is enclosed for your convenience.

EXAMINATIONS:

When you have completed the first 4 study units you may take the first (Mid-Course Test) of two written tests. When you have finish all 8 of the study units, you may take the second (Final-Course Test) written test. This test will be comprehensive over the entire course but with heavier emphasis on the last four study unit sections. Both tests are proctored and open-book tests. You will be allowed to use your calculator in working problems, except when directions indicate otherwise. You will be allowed 90 minute on the first test and 2 hours on the second test. Information on finding a proctor and securing your exam can be found on the goldenrod Test Request Form located at the back of this syllabus. This course requires a proctored Mid-Course Test and a Final Tests. You will be allowed 2 hours to write each test. Information on finding a proctor and securing your tests can be found on the green Test Request Form located in this syllabus. The tests are patterned after your unit assignments; you will find the same type of problems.

EVALUATION TECHNIQUE:

The grade you receive will be based on four grading components. Units 1-4 will count 20% of the course grade, the proctored Mid-Course Test will count as 20% of the course grade, Units 5-8 will count as 20% of the course grade and the proctored Final-Course Test will count as 40% of the course grade. All units and both tests will be graded on the basis of 100 points each.

- 90 – 100% = A
- 80 – 89% = B
- 65 – 79% = C
- 50 – 64% = D
- Below 50% = F
REVIEW UNIT I

READING ASSIGNMENT: Review Appendix A (following page 440). I have chosen some of the review exercises of Appendix A as part of this unit’s assignment. Then begin your study of section 1 of Chapter 1.

WRITTEN ASSIGNMENT: Work the following exercises for evaluation toward your course grade. Refer to this guide for specific instructions on completing your written assignments. Please identify the problems clearly as to page number and problem number. Please identify the problems clearly as to page numbers and problem number. Also, show ALL YOUR WORK in solving the problems.

Page 444: 6, 8, 10, 12, 14, 18, 22, 24
Page 449: 4, 8, 12, 16, 18, 24, 30, 32, 36, 38, 42, 44, 46, 50, 54
Page 457: 4, 8, 14, 18, 22, 28, 34,
Page 473: read for understanding and possibly later reference
Page 10: 4, 14, 18, 30, 34, 38, 40, 44, 54, 56, 60
STUDY UNIT II

READING ASSIGNMENT: Read and study Chapter 1; Sections 1.2 through 1.4 and section 2.1.

WRITTEN ASSIGNMENT: Work the following exercises for evaluation. Show ALL YOUR WORK in solving the problems.

Page 18: 4, 10, 14, 20, 22, 24, 26
Page 29: 4, 6, 10, 12, 18, 24, 26, 8, 3, 40, 44, 54, 62, 66
Page 35: 2, 3, 8, 10, 14, 18, 22, 26, 30, 38
Page 59: 8, 14, 18, 20, 22, 26, 28, 30, 34, 40, 42, 44, 48, 52, 58, 62, 70, 76
STUDY UNIT III

READING ASSIGNMENT: Read and study Chapter 2; Sections 2.2 through 2.6.

WRITTEN ASSIGNMENT: Work the following exercises for evaluation. Show ALL YOUR WORK in solving the problems.

Page 148: 2, 10, 12, 18, 22, 26, 32, 38
Page 67: 2, 4, 8, 12, 16, 24,
Page 77: 2, 8, 12, 14, 16, 26, 30, 36, 44, 50, 56, 58, 62, 70, 74, 78, 84, 88
Page 91: 2, 4, 8, 10, 12, 18
Page 102: 2, 8, 16, 24, 34, 40, 48, 58, 64, 66
Page 113: 2, 4, 8, 12, 16, 20, 24, 28, 32, 40, 50, 54, 58, 60, 63, 66, 68, 72
READING ASSIGNMENT: Read and study sections 3.1, 3.2, 3.3, 3.5, and 3.6. If you don’t have a graphics calculator omit those that require a calculator (have a calculator pictured beside the problem), and indicate that on you paper. Your grade will then be based on the other problems only.

WRITTEN ASSIGNMENT: Work the following exercises for evaluation.

Page 141: 2, 4, 6, 12, 16, 20, 22, 26, 30
Page 152: 4, 10, 12, 14, 18, 22, 24, 26, 32, 36, 44, 46, 52
Page 165: 6, 10, 12, 16, 18, 20, 22, 26, 28, 42, 44
Page 190: 2, 4, 8, 10, 14, 16, 18, 22
Page 201: 2, 10, 12, 16, 20, 22, 24, 26, 28
I recommend that you review for your first of two tests by returning to the review exercises (Chapter Review Exercises) at the end of each chapter in which I assigned problems and do lots of exercises of the type that were assigned for that chapter. You could also work some of the Cumulative Review Exercises of Chapters 1-3, beginning on page 211. Be sure that you are thorough. The only way to build confidence in solving problems is to practice. The answers to these review exercises appear at the end of the book.

When you think you are ready to take the mid-course test, complete the Test Request Form which follows. Note the specific instructions on finding a qualified proctor and securing your test. You will be notified when your test is in the mail.

**STUDY UNIT V**

**READING ASSIGNMENT:** Read and study sections 4.1 through 4.4. If you don’t have a graphics calculator omit those that require a calculator (have a calculator pictured beside the problem), and indicate that on your paper. Your grade will then be based on the other problems only.

**WRITTEN ASSIGNMENT:** Work the following exercise for evaluation. Show ALL YOUR WORK in solving the problems.

<table>
<thead>
<tr>
<th>Page 223:</th>
<th>6, 8, 12, 14, 18, 24, 26, 30, 32, 36, 40, 42, 44, 48, 52</th>
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<tr>
<td>Page 232:</td>
<td>2, 6, 12, 20, 26, 34, 38, 44, 50, 54, 58, 62, 64, 68, 74, 76</td>
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<tr>
<td>Page 241:</td>
<td>4, 6, 12, 14, 22, 26, 28, 32, 36, 40, 42, 54, 62</td>
</tr>
<tr>
<td>Page 250:</td>
<td>2, 4, 6, 8, 10, 14, 18, 24, 28, 32, 36, 40, 44, 48, 52, 66, 68</td>
</tr>
</tbody>
</table>
STUDY UNIT VI

READING ASSIGNMENT: Read and study sections Appendix B.2 and 5.1, 5.3 and 5.4. If you don’t have a graphics calculator omit section 5.4 and indicate that on your paper. Your grade will then be based on the other problems only.

WRITTEN ASSIGNMENT: Work the following exercises for evaluation. Show ALL YOUR WORK in solving the problems.

Page 470: 2, 4, 6, 8, 10, 14, 16, 18, 22, 24, 26, 28, 32
Page 287: 2, 6, 10, 14, 18, 22, 26, 32, 36, 40, 46, 50, 52, 54, 60, 64, 68, 70
Page 301: 2, 4, 6, 10, 14, 16, 18, 22, 26, 28, 32, 36, 40, 42
Page 308: 2, 4, 8, 12, 16, 22, 24, 26
STUDY UNIT VII

READING ASSIGNMENT: Read and study sections 6.1, 6.2, 6.4, and 6.5.

WRITTEN ASSIGNMENT: Work the following exercises for evaluation. Show ALL YOUR WORK in solving the problems.

Page 332: 2, 4, 6, 10, 18, 20, 26, 32, 36, 40, 46
Page 342: 2, 4, 6, 10, 12, 14, 20, 24, 30, 32, 36, 38, 50
Page 357: 2, 4, 6, 8, 10, 14, 20, 24, 30
Page 369: 2, 4, 6, 8, 10, 14, 16, 20, 24, 28, 30, 34, 36, 46, 48
READING ASSIGNMENT: Read and study Appendix A.2 and sections 7.1, 7.3, and 7.4. If you don’t have a graphics calculator omit those that require a calculator (have a calculator pictured beside the problem), and indicate that on your paper. Your grade will then be based on the other problems only.

WRITTEN ASSIGNMENT: Work the following exercises for evaluation. Show ALL YOUR WORK in solving the problems.

Page 449: 2, 4, 6, 8, 10, 12, 14, 16, 20, 24, 26, 28
Page 401: 2, 4, 10, 14, 16, 22, 26, 30, 36, 42, 50, 52, 56, 60
Page 421: 2, 4, 6, 10, 14, 18, 24, 28, 30, 36
Page 427: 2, 6, 8, 12, 16, 18, 20, 24, 26, 28, 34
Like the mid-course test, I recommend that you review for this test by returning to the review exercises (Chapter Review Exercises) at the end of each chapter in which I assigned problems and do lots of exercises of the types that were assigned for that chapter. Be sure that you are thorough. Again, the only way to build confidence in solving problems is to practice. The answers to these review exercises appear at the end of the text.

When you think you are ready to take the final-course test, complete the Test Request Form which follows. Note the specific instructions on finding a qualified proctor and securing your test. You will be notified when your test is in the mail.