MATH 108 6380 Trigonometry and Analytical Geometry (2158) MATH-108

Fall 2015   Section 6380   3 Credits   08/17/2015 to 10/11/2015

👤 Faculty Contact

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🖥 Course Description

(The second course in the two-course series MATH 107-108. An alternative to MATH 115.) Prerequisite: MATH 107 or an appropriate result on the placement test. An introduction to trigonometric functions, identities, and equations and their applications. The goal is to demonstrate fluency in the language of trigonometry, analytic geometry, and selected mathematical topics; communicate mathematical ideas appropriately; apply and prove trigonometric identities; solve triangles and trigonometric equations; and perform vector operations. Discussion covers analytical geometry and conic sections, systems of linear equations, matrices, sequences, and series. Students may receive credit for only one of the following courses: MATH 108 or MATH 115.

◎ Course Introduction

"When I trace at my pleasure the windings to and fro of the heavenly bodies, I no longer touch the earth with my feet: I stand in the presence of Zeus himself and take my fill of ambrosia, food of the gods." —Claudius Ptolemy (AD 85-165)

"So Mathematical Truth prefers simple words since the language of Truth is itself simple." —Tycho Brahe (1546–1601)

Trigonometry and analytical geometry have roots in the field of astronomy, and Claudius Ptolemy was an astronomer of enduring influence. The word *trigonometry* means literally "the measuring of triangles." The study of trigonometry begins by focusing upon the relationships between the sides and angles of right triangles. The concepts are extended to more general angles, and then to any real number.

Analytical geometry involves studying the conic sections: parabolas, circles, ellipses, and hyperbolas. By examining data meticulously compiled by Tycho Brahe, Johannes Kepler developed an elegant mathematical model of planetary motion, which concluded that the planets revolve about the sun in elliptical orbits. Up to that time, Ptolemy and others had formulated mathematical models requiring ever more complicated geometry with each modification!

📊 Course Outcomes

After completing this course, you should be able to

- demonstrate fluency in the language of trigonometry, analytical geometry, and selected mathematical topics, and communicate mathematical ideas using appropriate terminology and technology
- determine the values of the six trigonometric functions for any acute angle of a right triangle, for any angle in standard position, and for any real number
- apply and prove trigonometric identities, solve triangles and trigonometric equations, and perform vector operations
- analyze and graph trigonometric functions, inverse trigonometric functions, polar equations, parabolas, circles, ellipses, hyperbolas, and transformations of these graphs
- solve systems of linear equations, using graphing, substitution, elimination, and matrix methods, and identify and analyze arithmetic and geometric sequences and series
- apply mathematical modeling to translate, solve, and interpret applied problems

📗 Course Materials

[Click to access your course materials information (http://webapps.umuc.edu/UgcmBook/BPage.cfm?C=MATH%20108&S=6380&Sem=2158)](http://webapps.umuc.edu/UgcmBook/BPage.cfm?C=MATH%20108&S=6380&Sem=2158)

✳ Class Guidelines

Preparation

To succeed in an 8-week mathematics course, it is important to complete all assignments on time. Print out a copy of the Course Schedule and keep it in a place where you can consult it daily. Late work will be accepted only in cases of documented emergency.

Turn in your material on time. The syllabus is clear that no material will be accepted late. If you have a thing happening, let me know ahead of time. I can plan; you can plan; we'll both be much happier.

Classroom Management

Don't edit your posts in discussion sessions. After I see your post, it gets marked as read. If you go in and edit it, it doesn't show up as new again. So I never know you posted something new! And it won't get graded.

Log into our online classroom regularly to read news, participate in discussions, and post questions. After posting work in a discussion, check back into the discussion to read comments and make any necessary revisions.

Questions and thoughts of general interest to the class should be posted in the "Ask the Professor" or "Student Lounge" discussions. For questions pertaining to your own work in the course, please send an e-mail with our course name in the subject line.

If you need help or get lost, let me know. I have a lot of resources I can send you that will get you through this. But if you're lost, you gotta tell me where you last knew where you were. If you send me an email that just says "I am lost, help, I don't know what to do," I will have no idea where you are *or how to find you*. It's just like being lost in the real world. So when you do get lost, tell me exactly where you are or, if you can't, what's happening and how you got there. It will make it a lot easier on both of us.

Preferred Contact Method

Don't use the send a message feature in LEO. It goes to spam too frequently. Use your own email service and send a message to jphoward@faculty.umuc.edu. It will buzz my phone. I am unlikely to respond until the end of the day or even the next. But I will probably see it quickly.

Supplemental Materials

None.

✔ Grading Information

You are responsible for the following graded items:

Component	Weighted Percentage
LEO Participation	16%
Six Quizzes (7% each)	42%
One Project	18%
Final Examination	24%
Total	100%

The work you are required to do in this course consists of

- weekly reading assignments
- homework for practice
- participation
- quizzes
- a project
- a final examination

These course components are described below.

Weekly Reading Assignments

Even though there is no numerical score associated with the weekly reading assignments, how well you do in the course depends heavily on how conscientiously you follow the reading assignments.

When doing the reading for this course, you need to *slow down!*

Reading mathematics is not like reading anything else. You need to look carefully at the numbers and formulas and spend time making sure you understand them and that they make sense. Reading any mathematical text can take three to four times longer, per page, than reading a nonmathematical text.

Homework

There are homework assignments each week. The homework assignments give you practice in solving problems associated with each week's topics. Your aim should be mastery of all concepts.

Homework will not be collected. The best way to learn mathematics is to do mathematics, so your homework practice will be valuable preparation for participation, quiz, and exam work.

Participation

By registering for a Web-based course, you have made a commitment to participate in course discussions and online activities. Plan to participate regularly. Participation for this course is defined as proactive discussion and problem-solving. This requires you to actively reflect on weekly readings and to develop original ideas in your responses. You are expected to demonstrate critical thinking and your understanding of the content in the assigned readings as they relate to the issues identified in the discussions. You are encouraged to respond to other students as well as to your instructor. You are expected to adhere to the general rules of online etiquette.

You are expected to participate in 8 weekly discussions, and your goal is to earn at least 80 participation points.

For individual participation on an ongoing basis, there is a collection of participation topics posted in weekly LEO discussions. You are free to choose any topic, complying with the discussion instructions, provided someone else has not already attempted it or "reserved" it.

For each participation topic, you will earn up to 10 participation points for the accuracy of your solution. You may be given opportunities to attempt your solution more than one time. If you make an error, you may get feedback and a chance to edit your work and resubmit it. The goal of online participation and problem solving is to help you understand the concepts and to give you an opportunity to practice solving problems and get feedback from me. See the participation instructions in each weekly module for details and deadlines.

Online participation work is to be posted in LEO discussions. Participation work submitted by other means will not be accepted.

Quizzes

Quizzes are important milestones, as they provide valuable feedback for instructors and students. They are open book and will be given as indicated in the schedule.

Makeup quizzes are not available **except** in cases of documented emergency.

You will be given one week to work on each quiz, and the due dates of the quizzes and exams can be found in the schedule. Each quiz will be posted as an Assignment at the beginning of the designated academic week, and each will be due at the end of that academic week. Quizzes may be submitted in plain-text format, as attached files such as Microsoft Word documents, or as handwritten and scanned documents.

Quizzes must be individually completed and represent your own work. Neither collaboration nor consultation with others is allowed.

To keep up with the pace of this course, you should submit quizzes on or before the due date. After the due date, solutions will be posted. Quizzes and exams submitted after the solutions are posted will not be accepted.

Final Examination

All sections of this course have a required final examination, administered in a 72 hour period during Week 8, the last week of the course.

The final exam is comprehensive, open book and includes multiple-choice and short answer questions. **You are required to show your work and calculations, where requested, in order to receive full credit.**

The final exam must be individually completed and represent your own personal work. Neither collaboration nor consultation with others is allowed.

The solutions for the final examination will not be posted.

You are expected to take the exam as scheduled. In the event of illness or extraordinary circumstances, you must contact your faculty member and provide documentation to request an exception and approval to take a makeup exam. If the request is not approved, the exam grade will be recorded as a zero.

Additional Information

Late Policy

Meeting course deadlines is crucial for success in computer-mediated courses. You may read at your own pace, but participation, quizzes, and projects must adhere to the timetable given in the schedule. Otherwise the grade will be zero. No late participation, quizzes, or exams will be accepted.

Guideline for Receiving Tutoring Services

We appreciate that many students may seek tutoring services to supplement our instructional program. However, tutors may not be used to complete any portion of assignments, projects, quizzes, and exams on behalf of students. Students are expected to submit their own work. Students who are suspected of submitting the work of their tutors will be reported to the dean's office for potential investigation.

If you are to receive tutoring services, inform your tutor of this expectation and clarify your tutor's role and responsibility to your academic endeavors at UMUC.

Project Descriptions

There is a project for this course due at the end of week 7. Project details will be released during week 3.

Academic Policies

Academic Policies and Guidelines

ACADEMIC INTEGRITY

As a member of the University of Maryland University College (UMUC) academic community that honors integrity and respect for others you are expected to maintain a high level of personal integrity in your academic work at all times. Your work should be original and must not be reused in other courses.

CLASSROOM CIVILITY

Students are expected to work together cooperatively, and treat fellow students and faculty with respect, showing professionalism and courtesy in all interactions. Please review the Code of Civility for more guidance on interacting in UMUC classrooms: https://www.umuc.edu/students/support/studentlife/conduct/code.cfm (https://www.umuc.edu/students/support/studentlife/conduct/code.cfm).

POLICIES AND PROCEDURES

UMUC is committed to ensuring that all individuals are treated equally according to Policy 040.30 Affirmative Action, Equal Opportunity, and Sexual Harassment (https://www.umuc.edu/policies/adminpolicies/admin04030.cfm).

Students with disabilities who need accommodations in a course are encouraged to contact the Office of Accessibility Services (OAS) at accessibilityservices@umuc.edu, or call 800-888-UMUC (8682) or 240-684-2287.

The following academic policies and procedures apply to this course and your studies at UMUC.

150.25	Academic Dishonesty and Plagiarism (https://www.umuc.edu/policies/academicpolicies/aa15025.cfm) – UMUC defines academic dishonesty as the failure to maintain academic integrity. All charges of academic dishonesty will be brought in accordance with this Policy. *Note:* Your instructor may use **Turnitin.com**, an educational tool that helps identify and prevent plagiarism from Internet resources, by requiring you to submit assignments electronically. To learn more about the tool and options regarding the storage of your assignment in the Turnitin database go to: https://www.umuc.edu/library/libresources/turnitin.cfm (https://www.umuc.edu/library/libresources/turnitin.cfm).
151.00	Code of Student Conduct (https://www.umuc.edu/policies/studentpolicies/stud15100.cfm)

170.40	The following policies describe the requirements for the award of each degree:
170.41	Degree Completion Requirements for the Graduate School (https://www.umuc.edu/policies/academicpolicies/aa17040.cfm)
170.42	Degree Completion Requirements for a Bachelor's Degree (https://www.umuc.edu/policies/academicpolicies/aa17041.cfm)
	Degree Completion Requirements for an Associate's Degree (https://www.umuc.edu/policies/academicpolicies/aa17042.cfm)
170.71	Policy on Grade of Incomplete (https://www.umuc.edu/policies/academicpolicies/aa17071.cfm) - The grade of I is exceptional and only considered for students who have completed 60% of their coursework with a grade of B or better for graduate courses or C or better for undergraduate courses and request an I before the end of the term.
170.72	Course Withdrawal Policy (https://www.umuc.edu/policies/academicpolicies/aa17072.cfm) - Students must follow drop and withdrawal procedures and deadlines available at https://www.umuc.edu/ (https://www.umuc.edu/) under Academic Calendar.
130.80	Procedures for Review of Alleged Arbitrary and Capricious Grading (https://www.umuc.edu/policies/academicpolicies/aa13080.cfm) – appeals may be made on final course grades as described herein.
205.06	Calculation Of Grade-Point Average (GPA) for Inclusion on Transcripts and Transcript Requests (https://www.umuc.edu/policies/academicpolicies/aa20506.cfm) – Note: Undergraduate and Graduate Schools have different Grading Policies (i.e. The Graduate School does not award the grade of D). See Course Syllabus for Grading Policies.

GRADING

According to UMUC's grading policy, the following marks are used:

	Undergraduate	Graduate
A	90-100	90-100
B	80-89	80-89
C	70-79	70-79*
D	60-69	N/A**
F	59 or below	69 or below
FN	Failure-Non attendance	Failure-Non attendance
G	Grade Pending	Grade Pending
P	Passing	Passing
S	Satisfactory	Satisfactory
U	Unsatisfactory	Unsatisfactory
I	Incomplete	Incomplete
AU	Audit	Audit
W	Withdrew	Withdrew

* The grade of "B" represents the benchmark for The Graduate School. Students must maintain a Grade Point Average (GPA) of 3.0 or higher. Classes where final grade of C or F places a student on Academic Probation must be repeated.
** The Graduate School does not award the grade of D.

COURSE EVALUATION SURVEY

UMUC values its students' feedback. You will be asked to complete an online evaluation toward the end of the term. The primary purpose of this evaluation process is to assess the effectiveness of classroom instruction in order to provide the best learning experience possible and make continuous improvements to every class. Responses are kept confidential. Please take full advantage of this opportunity to provide your feedback.

LIBRARY SUPPORT

Extensive library resources and services are available online, 24 hours a day, seven days a week at https://www.umuc.edu/library/index.cfm (https://www.umuc.edu/library/index.cfm) to support you in your studies. The UMUC Library provides research assistance in creating search strategies, selecting relevant databases, and evaluating and citing resources in a variety of formats via its Ask a Librarian service at https://www.umuc.edu/library/libask/index.cfm (https://www.umuc.edu/library/libask/index.cfm).

LEARNING MANAGEMENT SYSTEM SUPPORT

To successfully navigate the online classroom new students are encouraged to view the Classroom Walkthrough under Help in the upper right menu of the LEO classroom. Those requiring technical assistance can access Help@UMUC Support directly in LEO under the Help menu. Additional technical support is available 24 hours a day, seven days a week via self-help and live chat at https://www.umuc.edu/help (https://www.umuc.edu/help) or by phone toll-free at 888-360-UMUC (8682).

SYLLABUS CHANGES

All items on this syllabus are subject to change at the discretion of the Instructor and the Office of Academic Affairs.

📅 Class & Assignment Schedule

Students have access to a calendar tool on the course homepage within the classroom. All assignments are due at the end of the day (11:59pm in the US Eastern time zone) on the specified dates. A world clock is found at: http://www.timeanddate.com/worldclock/ (http://www.timeanddate.com/worldclock/)

Week	Activities
1	**Week 1: The Trigonometric Functions** (8/17 - 8/23) Read: • News (announcements on home page) • Syllabus • Week 1 Learning Resources Do: • Familiarize yourself with the Course Resources in LEO, including the textbook, course modules, and supplementary course materials • Introduce yourself and meet your classmates in the Introductions discussion (optional) • Post any questions in the "Ask the Professor" discussion (if desired) • Homework • Participation**: due Sunday**
2	Week 2: Graphing, Inverse Trigonometric Functions, Identities, and Equations (8/24 - 8/30) Read: • Week 2 Learning Resources Do: • Quiz 1, covering Week 1 course material: due Sunday • Homework • Participation: **due Sunday**
3	Week 3: Applications of Trigonometry (8/31 - 9/6) Read: • Week 3 Learning Resources Do: • Quiz 2, covering Week 2 course material: due Sunday • Homework • Participation: **due Sunday**

4	**Week 4: Polar Coordinates and Vectors** (9/7 - 9/13) Read: - Week 4 Learning Resources Do: - **Quiz 3**, covering Week 3 course material: due Sunday - Homework - Participation: **due Sunday**
5	**Week 5: The Circle, Parabola, Ellipse, and Hyperbola** (9/14 - 9/20) Read: - Week 5 Learning Resources Do: - **Quiz 4**, covering Week 4 course material: due Sunday - Homework - Participation: **due Sunday**
6	**Week 6: Systems of Equations and Matrices** (9/21 - 9/27) Read: - Week 6 Learning Resources Do: - **Quiz 5**, covering Week 5 course material: due Sunday - Homework - Participation: **due Sunday**
7	**Week 7: Arithmetic and Geometric Sequences and Series** (9/28 - 10/4) Read: - Week 7 Learning Resources Do: - **Quiz 6**, covering Week 6 course material: due Sunday - **Project**: due Sunday - Homework - Participation: **due Sunday**
8	**Week 8: Review and Final Exam** (10/5 - 10/11) Do: - Homework (review exercises) - Participation: due Sunday - **Final Exam** (cumulative): due Sunday The **Final Exam** will be available in **LEO** at 12:01 a.m. on Friday. The **Final Exam** is due 11:59 p.m. on Sunday. It is comprehensive, open book and includes multiple-choice and short answer questions. You are required to show your work and calculations, where requested, in order to receive full credit. The final exam must be individually completed and represent your own personal work. Neither collaboration nor consultation with others is allowed. The solutions for the final exam will not be posted.