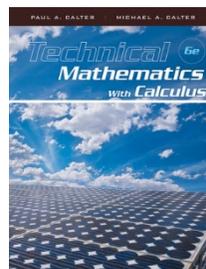


Math 1230— Mathematics for Architecture and Construction

Course Description: Math 1230: Mathematics for Architecture and Construction is a 5 credit hour course that covers unit conversions; geometry; trigonometry of angles; laws of cosines and sines; solving triangles; vectors; analytic geometry; conceptual introduction to differential and integral calculus. This course is specifically designed to prepare students for required courses in the Architecture and Construction Management programs. Prerequisite: Grade of C or higher in Math 1200 or 1220, or satisfactory placement exam score.

Upon successful completion of the course the student will be able to demonstrate the ability to solve triangular, linear and conic relationships in technical and physical word problems algebraically, numerically and graphically to the required degree of accuracy and unit of measurement.

Required Text: *Technical Mathematics*, by Calter and Calter, 6th Edition, J. Wiley and Sons. Text is also available online for free through OhioLink as an [eBook](#).



Calculator: The TI-83 (plus) or TI-84 (plus) graphing calculator will be required for use in this class. If you have a different calculator you may need to find the manual and I will do my best outside of class to help you use it.



Grading Policy: There will be five exams and one final exam, which is cumulative. Graded homework and quizzes will also be included in the calculation of the final grade. There will be NO opportunities to make up any missed homework points! Due dates and exam days may change throughout the semester. You can check on your grade at anytime using the GRADES link on the left. The weight of each grading component is at the right. You have until the last day of the 12th week to drop or change the grading option for the course. (http://www2.bgsu.edu/catalog/Acad_policies/Acad_policies41.html)

Homework: At the end of each section you will be given a homework assignment. They will be graded for accuracy and completion. Some of your homework will be submit online using [MyOpenMath](#), a free online homework system. The course ID for the course is 14458 and the enrollment key is math1230. They will be due at the beginning of class and I reserve the right to not accept any homework after class has begun. I expect these assignments to be done neatly. **You**

must also show all work to receive credit. It is acceptable, in fact encouraged, for you to use classroom notes, the textbook, and even your classmates to complete the assignments. You may also come see me during office hours if you need additional help. The lowest homework score will be dropped and therefore **no late assignments will be accepted.**

Quizzes: Quizzes will be given on a weekly basis. You will not be allowed to use your notes or book for a quiz unless given explicit instruction otherwise. There will be at least 12 quizzes in total for the semester and I will only count your top 10 quiz scores (so the more quizzes we take the better your chances are for increasing your grade). However, you will not be able to drop the first quiz. Make-up quizzes will only be given in extreme circumstances. Any quiz missed due to a university related event that you are required to attend can also be made up but you must inform me in advance that you will be unable to attend class.

QUIZZES



Attendance and Participation: The Department of Mathematics and Statistics has found that class ATTENDANCE and PARTICIPATION are important elements of student success. While a few students might find it possible to succeed without regular attendance, most students will find that regular attendance is necessary for success in this course. This does not mean that attendance by itself will generate success in this course – you must also learn the content of the course. All students should (1) make regular course attendance a priority, (2) devote significant time to studying for this course, and (3) complete all course assignments on time. You are expected to attend class regularly and actively participate in this course. I will be keeping attendance simply for my records, but attendance will not be counted towards your grade. It is your responsibility to let me know, in advance if possible, when you will miss class and how you plan to make-up the material that you missed.



Exams: There will be four exams given plus a comprehensive final exam. Make-up exams will only be given in extreme circumstances. Any exam missed due to a university related event that you are required to attend can also be made up but you must inform me in advance that you will be unable to attend class.

Tutoring: Math tutoring is available in the Learning Commons on the first floor of Jerome Library. Refer to the website for services available: <http://www.bgsu.edu/learning-commons.html>.

Department Mediator: Dr. Kit Chan, 415 MSC, (419)-372-7468



If a student has a problem with this course, the student should first discuss the problem with the instructor. If the problem persists or is unresolved, the student should then contact the course coordinator (Beth Burns). If the problem is still unresolved, the student should finally contact the department mediator.

Disability Policy: In accordance with the University policy, if the student has a documented disability and requires accommodations to obtain equal access in this course, he or she should contact the instructor at the beginning of the semester and make this need known. Students with disabilities must verify their eligibility through the Office of Disability Services for Students, 38 College Park, 419-372-8495. (<http://www.bgsu.edu/disability-services.html>)

Codes of Conduct and Academic Honesty Policy: The instructor and students in this course will adhere to the University's general Codes of Conduct defined in the BGSU Student Handbook. The Code of Academic Conduct (Academic Honesty Policy) requires that students do not engage in academic dishonesty. For details, refer to: [BGSU Student Handbook](#)



Classroom Respect: It goes without saying that I expect my students to behave in a mature, respectful manner. This includes using common courtesy with your cell phones. Please silence your phones before class begins.

In a number of problems, you will be given a verbal description or a picture of an object and the numerical dimensions of the object. You will find other dimensions using tools and concepts you have learned in class. This may include, but is not limited to, using formulas, creating a table of the information given, interpreting a graph or creating a graph of the model (function), and/or drawing a schematic and labeling the information given in the question.

How problems will be graded in this course: Problems on homework, quizzes, and exams will be graded for correctness of intermediate steps, not just for the final answer. Partial credit may be given if the logic of the problem is correct but a very minor arithmetic mistake makes the final answer incorrect. You need to explain your thought process as well as describe in words what the terms in the equations represent. Any pictures, graphs, schematics and/or tables that are used to solve the question must be made carefully and accurately. For "story problems," most of the credit for each question is received for setting up the question correctly.

Course Learning Objectives:

- Interpret answers on a scientific calculator for accuracy and usefulness.
- Express diverse numeric answers with the suitable accuracy, format and unit of measurement.
- Solve literal equations and formulas.
- Solve systems of equations algebraically, graphically and with the aid of a scientific calculator.
- Solve word problems relating to linear equations algebraically and graphically with simple applications in uniform motion, money, mixtures and statics.
- Find perimeter, area and volume of circles, triangles and solid figures by applying formulas.
- Solve applied right and oblique triangle word problems.
- Perform operations including geometric and trigonometric properties to two-dimensional vectors.
- Apply the derivative to the determination of maxima and minima, with emphasis on problems involving volumes/surface areas of standard container shapes (cylinders, boxes, etc.), etc.
- Apply the integral to determine areas under curves, between 2 curves and application problems of the integral.
- Identify conic sections and solve applications involving conic sections.

How this course addresses the Quantitative Literacy learning outcomes: Math 1230 can be used to satisfy the Quantitative Literacy requirement at BGSU. Quantitative Literacy courses have five broad learning outcomes. Below is a list of these learning outcomes and the ways in which Math 1230 addresses them.

- **Interpret mathematical and statistical models such as formulas, graphs, tables, and schematics, and draw inferences from them.** Physical measurements are often taken in one set of units (for example, feet and inches) but need to be converted to other units (for example, miles), or need to be combined together and then converted when using geometrical formulas (for example, how many loads of asphalt will be needed to pave a road that is 20 feet wide, 6 inches deep, and 5 miles long? Treat the road surface as a long rectangular box, and account for the volume of a load of asphalt.). By the end of the course, students should become very comfortable expressing measured and computed quantities in a variety of units, and converting between them as needed.
- **Represent mathematical and statistical information symbolically, visually, numerically, and verbally.** Being able to think through how to solve a problem is fundamental to all the types of applications in the course. Simple mixture, distance/rate/time, work, geometry, trigonometry etc. problems make you work through problem solving using mathematical tools you have learned in this class and previous classes. For each question you may need to use visual (draw a picture), numerical (write an equation or calculate a value) and/or verbal (write in words what a given term represents in an equation) approaches to solving the problem.
- **Use arithmetical, algebraic, geometric and statistical methods to solve problems.** After representing the problem you may use arithmetical (trial-and-error), algebraic (solve an equation) and/or geometric (formulas, trigonometry) to solve the problem. A large percentage of your time in the course will be spent solving problems.

- **Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.** Before starting a problem you will be asked to make a reasonable guess what the answer may be. After you find the solution you will be asked “Is this a reasonable solution?” Many of the equations that are solved may have two or more answers. You will need to determine which one makes sense in context of the situation.
- **Recognize that mathematical and statistical methods are based on assumptions and have limits.** At many points in the course we make a simplified mathematical model for some real-world entity (approximating a water tank as a cylinder, for example). At other times, it is explicitly recognized that we cannot make simplifying assumptions, so there may not be a simplified mathematical model available