

**Syllabus Math 162**  
**UNM Valencia Summer 2017**

**Prerequisites:** (ACT=28-31 or SAT=640-700 or MATH 150 or Compass College Algebra >66) and (MATH 123 or compass Trig >59) or (ACT=>32 or SAT=>700)

**TEXTBOOK:** Thomas' Calculus 13th Edition.

**Instructor:** Alfonso Heras [aheras@unm.edu](mailto:aheras@unm.edu)

**Office Hours:** TBA

*No calculators on exams.*

**Catalog Description:** Limits. Continuity. Derivative: definition, rules, geometric interpretation and as rate-of-change, applications to graphing, linearization and optimization. Integral: definition, fundamental theorem of calculus, substitution, applications such as areas, volumes, work, averages.

**Content:** Most of Chapters 2-6.

**COURSE WEBSITE:** learn.unm.edu

**GRADING:** Your total course grade is obtained from your percentage grade out of the following:

Three in-class exams: 100 pts each

Daily Quizzes: 200 pts (At the stem Center) we keep the best 12.

Final Exam: 200 pts

Total: 700 pts

**HOMEWORK:** Your homework is your most important effort in this class; homework is how you learn the material that will be on the quizzes and exams.

Expect to do 2-3 hours of homework for every hour of class meeting time (on average 10-15 hours per week). Each day, you need to do a written homework posted on your learn.unm.edu account, that you must write out by hand. This homework is due at the beginning of the class. The "Daily Written" problems must be clearly and neatly written up in a folder or notebook that you need to bring with you when you go to see the instructor or get tutoring.

The "Daily Written" problems are representative of most of the material you will be tested on in exams and quizzes. You therefore need to do all the listed problems daily to succeed. Unfortunately, we cannot collect the problems for grading. It is your responsibility to do these problems and ask your instructor about anything you do not understand.

**QUIZZES:** There will be a daily quiz given in class, consisting of recent homework problems.

To do well on the quizzes, make sure to fully understand the solution to these homework problems. As a bonus, you will then understand the material well and will also do well on the exams.

There will be no makeup quizzes unless you contact your instructor ahead of time with a documented "university authorized absence" (documented illness, family emergency, active participation in scholarly or athletic events).

*The first quiz will be given on the second day of classes.*

**EXAMS:** The in-class exams and the final exam will cover problems like all the assigned homework problems, a selection of which is given in review sheets for each exam. The exam dates are given in the syllabus. No makeup exams will be given unless you contact your instructor ahead of time with a documented "university authorized absence" (illness, family emergency, active participation in scholarly or athletic events).

**GRADING GUIDELINES:** To get full credit on exams, homework, quizzes, worksheets, you need to show your work, neatly, in clear and correct mathematical notation, annotated by English sentences where appropriate. You will be graded based on the work shown, not on the answer.

**CALCULATORS:** Graphing calculators and other technology (eg, MATLAB) can be used effectively to illustrate many basic concepts and promote understanding. However, the student must master many basic algebraic and graphing skills without a calculator. To promote these skills, we **will not** use any (graphing or non-graphing) calculators on the exams or quizzes.

**ATTENDANCE:** Attendance is mandatory. If you have three or more unexcused absences your instructor may drop you from the class. However, you are ultimately responsible for dropping your class if you cannot attend.

**STUDENT BEHAVIOUR:** Be courteous and respectful towards the class: be on time for lectures, turn off cellphones and refrain from talking in class, leaving the classroom in the middle of a lecture or doing any other activity that could be disruptive to the class. Cheating will not be tolerated.

**DISABILITY STATEMENT:** Students with documented disabilities must inform their instructor of their needs during the first two weeks of the semester.

**LEARNING OUTCOMES** Students that successfully complete the course, will, by the end of the course, be able to

1. State, motivate and interpret the definitions of continuity, the derivative, and the definite integral of a function, including an illustrative figure, and apply the definition to test for continuity and differentiability. In all cases, limits are computed using correct and clear notation. Student is able to interpret the derivative as an instantaneous rate of change, and the definite integral as an averaging process.
2. Use the derivative to graph functions, approximate functions, and solve optimization problems. In all cases, the work, including all necessary algebra, is shown clearly, concisely, in a well organized fashion. Graphs are neat and well-annotated, clearly indicating limiting behavior. English sentences summarize the main results and appropriate units are used for all dimensional applications.
3. Graph, differentiate, optimize, approximate and integrate functions containing parameters, and functions defined piecewise. Differentiate and approximate functions defined implicitly.
4. Apply tools from precalculus and trigonometry correctly in multi-step problems, such as basic geometric formulas, graphs of basic functions, and algebra to solve equations and inequalities.
5. State the main theorems of calculus correctly, including all conditions, and give examples of applications. These include the Intermediate Value Theorem, the Mean Value Theorem, the Extreme Value Theorem, and the Fundamental Theorem of Calculus.
6. Solve simple first and second order differential equations, either initial or boundary value problems, including problems where the derivative is given by a piecewise function, or when the initial value problem is described in words, such as in applications from physics, biology and engineering. Be familiar with the harmonic oscillator and describe period, amplitude, phase shift of the trigonometric functions that appear.
7. Compute integrals using the method of substitution, including changing the bounds in the case of definite integrals.

**For Breaks and Holidays: See UNM Catalog**

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