Instructor: Jim Swift  Adel Math Bldg. 110  523-6878  Jim.Swift@NAU.edu

Office Hours: Mon.  2:30-3:00, Tu.  11:30-12:30, Wed.  3:30-5:00, and Th.  10:20-11:20, 3:30-4:00. If these times are inconvenient, you can make an appointment, or drop by my office any time. E-mail is always a good way to contact me. I will check my e-mail after 9:00pm on nights before a WeBWorK assignment is due, and reply that night.

Websites: www.nau.edu/Jim.Swift is my web site. Follow the “Teaching” link. On the instructor information page, there is a link to the web site for this class. The website has the course outline in the form of a day-by-day schedule that we will follow.

Course Description and Objectives: MAT 136 is a four credit hour course that meets 200 minutes each week. The course initiates the study of calculus with emphasis on limits, differentiation, the beginnings of integration and the applications of the ideas to geometry and the natural sciences. This courses addresses the essential skills of critical thinking, quantitative analysis, and the use of technology.

Student Learning Outcomes: Upon completion of the course, students should be able to calculate limits by a variety of methods, apply these methods to the calculation of derivatives from the definition of derivative, be able to take derivatives of the basic algebraic and transcendental functions and to use the chain rule to take derivatives of more complex functions. They will be able to correctly interpret the meaning of the derivative in terms of rates and tangent lines and do numerical approximations. They will be able to apply their knowledge of the derivatives of functions to find tangent lines and rates of change in a variety of circumstances and to find maximums and minimums of functions and be able to use this knowledge to analyze graphs. They will be able to find higher derivatives and use them to investigate concavity and the application of concavity to maximum and minimum problems and to acceleration. They will be able to take derivatives in complicated situations by use of logarithmic differentiation and implicit differentiation. In addition, they will be able to find easy antiderivitives and apply this knowledge to the calculation of areas using the fundamental theorem of Calculus and to do some more complex integrals by the use of tables and substitution.

Text: We will use on-line notes by Paul Dawkins of Lamar University, freely available at http://tutorial.math.lamar.edu/Classes/CalcI/CalcI.aspx. There is a link to these note at our class home page, and the notes come up first with a google search for Paul Calculus I.
Course Outline: We will cover the following topics (in order)
    Review of functions
    Limits
    Derivatives
    Applications of derivatives
    Integrals, methods of integration

Prerequisite: A grade of C or better in MAT 125, or an MAT placement code of 70. That placement code corresponds to 27 on the ACT, 620 on the SAT, or an Accuplacer score of 85.

Course Structure The class will mostly use lecture-discussion format. There will be several in-class group work projects. Students will apply what they have learned to solve homework problems. Problems will come mostly from WebWorK.

Assessment of Student Learning Outcomes

Points: There are approximately 1050 class points possible, plus extra credit. (Numbers in italics are estimates and subject to change.) Class points can always be converted to letter grades with the scale A (90%), B (80%), C (70%), and D (60%).

The timeline for assessment is simple; whenever class points are assigned, they are fully “curved” and will not change further. So at any point students can calculate the fraction of the assigned class points to determine their current grade.

Midterms: (4 × 100 = 400 points) There will be 3 or 4 midterm exams. All of the midterms count. The schedule at my website gives tentative exam days.

Homework: (28 × 10 + 2 × 5 = 290 points). Regular homework assignments will be given in WeBWorK, a web-based homework system. Each assignment is worth 10 class points. There may occasionally be written homework assignments as well, worth 5 class points. You are allowed and encouraged to form study groups to work on homework and study for tests. WeBWorK gives random problems, so your problems will be slightly different from those of your classmates.

Technology Projects/Group Work: (6 × 10 = 60 points) We will have approximately 6 projects. They are each worth 10 class points. These will usually involve technology, in the form of either graphing calculators or computers.

Final Exam: (300 points) The comprehensive Final Exam is scheduled for Wednesday, May 6 from 10:00 to 12:00. The final exam will be in our usual classroom. I reserve the right to raise your course grade from the 90/80/70 curve, based on an exceptional final exam.
**Extra Credit:** At each midterm exam I will give you 3 class points if you had no unexcused absences since the previous exam.

Points that you get for the “Problem of the Week” will be credited to this class, at a rate of one class point for every POTW point. These points will be added at the end of the semester.

Other extra credit opportunities may be available.

**Course Policies**

**Calculators:** Graphing calculators will be allowed at most tests. The exceptions are Exam 3 and the first part of the Final Exam. These exceptions are due to the availability of TI-89 and TI-Nspire calculators which can do symbolic differentiation and integration. A TI-83 Plus, TI-84 Plus, or TI-86 is sufficient for this course and beyond. Other makes of calculators are also fine. The CAS (computer algebra system) power of the TI-89 and TI-Nspire are also available in computer packages such as Mathematica, Matlab and Maple. All CENS students can use Mathematica and Matlab through the secure global desktop [http://sgd.cefns.nau.edu/](http://sgd.cefns.nau.edu/).

**Computer Lab:** The departmental computer lab, in AMB 222, is available for your use starting the second week of classes. (The hours are to be announced.)

**Excused Absences:** If you have an institutional excuse, you will not lose the attendance extra credit. If you have feel you deserve an excused absence for some other reason contact me by e-mail, phone, or in person. Do so before the absence, if possible. Makeup exams will be given only in extenuating circumstances. Contact me before an exam if you must miss it.

**Late Homework:** I can delay your individual due date for WeBWorK assignments. I will handle requests on a case-by-case basis, but you must contact me before the due date since the answers are made available at that time.

**Help:** If you need help the first person to contact is me. I am your personal tutor at no charge. You can come to my office hours or contact me via e-mail. There is a button in WeBWorK for sending me e-mail. The math department also has a list of tutors for hire, available from the department office. The Learning Assistance Center ([www4.nau.edu/lac](http://www4.nau.edu/lac)) has an array of services.

**No Cheating:** Cheating will not be tolerated. No cell phones usage is allowed during tests. No connection to the internet is allowed during tests. You may work together on the homework.

**University Policies:** Our web site has a link to the university’s safe working and learning environment, students with disabilities, institutional review board, and academic integrity policies. [jan.ucc.nau.edu/academicadmin/plcystmt.html](http://jan.ucc.nau.edu/academicadmin/plcystmt.html)

**Amendments:** Any changes to this syllabus will be announced in class, and an updated version will be posted on my website.