

**CRN:** 40401

**Class Meets:** 12:10 – 1:00 p.m., MTWF, EDBH 134 K (Ed Beaty Hall)

**Office Hours:** See [My Weekly Schedule](http://my-weekly-schedule/). ( <http://harryzaims.com/my-schedule/my-schedule-spring-16.pdf> )

**Calendar:** See Semester Schedule

**Instructor:** Dr. Harry S. (Steve) Mills

**Office:** EDBH 134 K

**Phone:** (970) 339-6238 (Office) (970) 290-0550 (Cell)

**My Weekly Schedule:** <http://my-schedule/my-schedule-spring-16.pdf>

**E-Mail:** Use E-Mail tool on Course Website. Emergency e-mail: [steve.mills@aims.edu](mailto:steve.mills@aims.edu)

**Text:** *Calculus*, 7<sup>th</sup> Edition, by Stewart

**Catalog Description:** Completes the traditional subject matter of the Calculus. Topics include vectors, vector-valued functions, and multivariable calculus including partial derivatives, multiple integrals, line integrals and application. This course is a state guaranteed transfer course GT-MA1. Prerequisite(s): MAT 202 with grade of C or better, or assessment. Four credits.

**Standard Policies and Services:** To reduce the amount of boilerplate in this syllabus, I refer you to [Aims Standard Syllabus Policies](http://www.aims.edu/inside/policies/standard-syllabus/) ( <http://www.aims.edu/inside/policies/standard-syllabus/> ), which include materials on student conduct, students with disabilities (ADA), and provide current links to standard policies and services.

**Grades:** 2 categories, unless we find there's time to add – and there's interest in – a “projects” category.

1. Tests (60%): 5 Tests. 4 hour-long tests, plus a 2-hour, comprehensive Final Test. Your lowest test will be given half the weight of the other 4. Final Test is included with all the rest, but knowing your worst only counts half, you should have more confidence in securing your final grade.
2. Homework (40%): Those who've been in my previous courses know how I want homework formatted.

### **Grades Miscellany:**

**Incomplete "I":** You must successfully complete 75% of the course *and* have a compelling reason for an Incomplete.

**Add/Drop:** Last day to Add/Drop this course is January 28th.

**Withdraw "W":** The Grading System definition of a W is: "WITHDRAWAL: Indicates withdrawal from the course. Last day to withdraw is April 10th. No Ws given after that date!"

**Audit Grade:** See the catalog. The student must obtain instructor approval by the Drop/Add deadline for the course.

**Course Delivery:** A mix of video and in-class discussion and work. I'll have *Maple* installed on the classroom computer. I want to see people using it or the CAS of their choice, for closer-to-real-world problems/projects. Engineering programs around the state use programs such as *MathCad*, *MatLab*, *Mathematica* (See Wolfram Alpha site.), etc.

### **Standard Competencies:**

- I. Solve problems involving curves defined parametrically which involves slope and area.
- II. Demonstrate vector arithmetic
- III. Describe the difference between scalars and vectors geometrically and algebraically
- IV. Demonstrate the ability to work with vector valued functions. This includes limits, continuity, derivatives, and integrals
- V. Solve problems involving velocity and acceleration
- VI. Solve problems involving the unit tangent and unit perpendicular vector, the unit binomial vector, curvature and tangential and normal components of acceleration both in two space and three space.
- VII. Demonstrate the ability to graph in three dimensions, and know the formulas of basic three dimensional objects such as spheres and planes.

- VIII. work problems involving the dot and cross product.
- IX. Demonstrate an understanding of the interpretation of these operations.
- X work problems of the line in three space both symmetrically and parametrically.
- XI. Identify the 6 basic different surfaces in three dimensions. These surfaces are the ellipsoid, hyperboloid of one and two sheets, elliptic paraboloid, and hyperbolic, paraboloid and elliptic cone.
- XII. Relate problems in the rectangular coordinates to the cylindrical coordinates and spherical coordinates.
- XIII. Apply the concept of the partial derivative
- XIV. understand the concept of differentiability and its relationship to the gradient. This includes working problems involving these concepts.
- XV. demonstrate an understanding of the directional derivative, level curves and level surfaces.
- XVI. Solve problems involving the chain rule for many variables.
- XVII. demonstrate the ability to work problems involving maxima and minima both with the second partials test and Lagrange's method.
- XVIII. Demonstrate the ability to work with the double and triple integral and understand applications. The student will also understand the use of the surface area integral.
- XIX. Demonstrate knowledge of vectors fields, the potential function, and the divergence and curl of a vector field.
- XX Show proficiency with the line integral and independence of path.
- XXI. Demonstrate ability to do problems involving surface integrals.
- XXII. Demonstrate knowledge of the theorems of Green, Gauss, and Stokes and applying the theorems.
- XXIII. Demonstrate a basic knowledge of linear algebra.