Calculus III: 2013 –14
Ladue Horton Watkins High School

Instructor: Dr. John Pais

Overview:

This course is an introduction to the study of curves and surfaces in three dimensional Euclidean space. For the first time in their mathematical development students will acquire the tools necessary to represent and analyze both the motion of particles and the forces acting on them in the proper geometrical setting. In addition, this course will not only develop high level mathematics skills, but also emphasize problem solving techniques, examine the necessity of mathematics as it relates to career goals, enable students to communicate mathematically, and illustrate the connection to real-world application.

Learning takes place through many types of activities we engage in during each ninety-minute period we meet. While mastery of formal objectives may be measured through tests, quizzes, and projects, other important skills developed in class are not so easily measured in traditional assessments. Students who attend with the intent to learn will construct knowledge both formally and informally. When the entire group comes to the classroom prepared to learn, an environment conducive to growth is created.

Course Description:

Calculus III is a continuation of the material covered in AP Calculus BC. Topics covered include vectors and curves in two and three dimensions, quadric surfaces, partial derivatives, extrema (maxima and minima), Lagrange multipliers, vector fields in two and three dimensions, double and triple integrals, Green's Theorem, Stokes Theorem, Divergence Theorem, and differential equations. Graphing calculators and *MAPLE*® software are used throughout the course. It is recommended that students have a grade of B or better in AP Calculus BC before enrolling in the course.

Methods of Instruction:

Class time is spent primarily in an interactive lecture/discussion/practice problem-solving format which includes question and answer sessions, class discussion, interactive visual-ization, guided practice, note taking, and seat work.

Classroom Expectations:

1. Be in your assigned seat, prepared and ready to work, when the bell rings.

2. Talk when it is appropriate - do not interrupt someone else who is speaking.

3. Follow directions the first time they are given.

4. Always respect other people, property, and yourself.

5. Cell phones should be turned off during the school day. Students should not listen to music during class.

Grades:

Grades are determined on total points earned. Points are earned through tests, quizzes, warm-ups, homework checks, homework quizzes, projects, and in-class activities. This is a yearlong course and so a final exam is given at the end of each semester worth twenty percent of the semester grade.

Grading Scale:

H 97 - 100% B 83 86% C 70 72% F Below 60%

A 93 - 96% B 80 82% D+ 67 69%

A 90 92% C+ 77 79% D 63 66%

B+ 87 89% C 73 76% D- 60 62%

Homework:

In order to receive credit for a homework check, the assignment should be complete, the problems written out, and all the necessary work shown. If the student does not know how to do a problem, something should still be written for the problem to show that the problem was attempted. All work should be done neatly and kept in each student's math notebook. Incomplete homework will receive half credit or less.

Homework will also be checked through homework quizzes. Unannounced homework quizzes will be given frequently, so it is very important to keep up with daily homework.

Materials for Class and Website:

Each class day students should bring their math notebook or folder, pencils or pens, paper, assignments, and a calculator. Course materials and activities will be posted on (linked to) the class website located at http://drpcourses.blogspot.com/.

It is a **requirement of the course that the website be checked often**, since all course information will be posted there.

Attendance/Tardies:

The school policy will be followed regarding absences and tardies (see your student planner). Please remember that, according to district policy, absences not cleared within twenty four hours of the absence are unexcused. Unexcused absences will result in a zero for the assignments and activities for that day.

Makeup Work Due to Absence:

A one week deadline is given to makeup all missed assignments and tests. Tests may be made up during Academic Lab. If assignments, quizzes, and tests are not completed within one week of an absence, students will receive a zero. If the absence has been an extended absence due to special circumstances, please see me and we'll make appropriate arrangements. Please remember that, according to district policy, you will not be allowed credit for any work due or assigned on the day of an unexcused absence.

Communication:

I look forward to an exciting and successful school year! At any time if you have any questions or concerns, please ask me. I am usually available in the math office for help before or after school and during Academic Lab. In addition, the best way to reach me at school is via e-mail jpais@ladueschools.net .

Resources (Textbook - Marsden & Tromba):

Auroux, Denis. *Multivariable Calculus.* Mathematics 18.02, MITOPENCOURSEWARE, Massachusetts Institute of Technology, Fall 2007. Web. 23 July 2010.

Fleisch, Daniel. *A Student's Guide to Maxwell's Equation.* New York, NY: Cambridge University Press, 2008.

Marsden, Jerrold E., Tromba, Anthony J. *Vector Calculus, 5th Edition.* New York, NY: W. H. Freeman and Company, 2003.

Murray, Daniel A. *Differential and Integral Calculus.* New York, NY: Longmans, Green, and Company, 1908.

O'Neill, Barrett. *Elementary Differential Geometry, Revised 2nd Edition.* Burlington, MA: Academic Press Elsevier, Inc., 2006.

Stewart, James. *Multivariable Calculus, 6E*. Belmont, CA: Brooks/Cole, 2008.