Course Description
Vector products, lines and planes in three-dimensional space, quadric surfaces, cylindrical and spherical coordinates. Differential calculus of vector functions of a single variable: velocity and acceleration vectors, curvature. Partial differentiation, gradient, chain rule, directional derivatives, tangent planes, application to optimization. Multiple integration, change of coordinates, applications. Taylor’s Theorem for Functions of Several Variables, line and surface integrals, Stokes’ Theorem, Gauss’ Theorem.

Prerequisites: at least a C in MATH121 and MATH122

Course Objectives
• Since this is the third course in the basic calculus sequence, the objectives include a deepening of the understanding of the tools of calculus, derivatives and integrals, to analyze functions in a multi-dimensional setting.
• Use tools of linear algebra, geometry and calculus to describe curves, surfaces and solids in 2D and 3D space.

Topics covered
We will cover most material in the textbook.
Unit 1. Vectors, vector functions, curves and surfaces in space (Sections 10.1-6, 12.1-6, 13.1-4)
Unit 2. Calculus of functions of several variables (Sections 14.1-8, 15.1-9)
Unit 3. Vector calculus (Sections 16.1-9)

Class organization and grading
Homework is assigned through the online supplement to the textbook, called WebAssign. You will find more information about enrolling into it below. We will also have regular in class quizzes. Students will be asked to present some solutions of problems to the class for discussion. Some in-class activities will be based on students working together in groups and peer reviewing their work.
We will have two in-class tests and a final exam. All tests are cumulative since the material naturally builds up in layers and later concepts rely on the understanding of earlier ideas.

**Rules during exams:**
- Use black or blue pen or pencil.
- Don't leave the room without permission.
- You can usually leave the room after you are done. After the first person leaves the room nobody can go out for a bathroom break. If you leave while other people are still writing, close the door quietly.
- No hats with visors during tests and quizzes, baseball hats need to be turned to the back.
- Come on time! I will be early for a test and you can start early if you want. If you do oversleep, come in even if it is half way through the test, we will deal with it.

**Tentative Exam schedule and topics**
- Test 1: October 10 covers material from Chapters 10, 12 and 13
- Test 2: November 19 covers the previous material plus Chapters 14 and 15
- Final Exam: December 17 (at the regular class time) covers all sections, including Chapter 16.

The grade will be computed by averaging the scores on the 2 tests, the final, the homework percentage and the quiz percentage with equal weights. In case that the final exam is better than the average of the other 4 scores it will count twice the weight of the other components.

**My office is in 515 K Pray-Harrold; my office phone is 487-1657.**
My home phone is 665-2691 (Please, do not call me at home after 8 PM)
You can leave a message on my home answering machine. The best way to contact me is to write me an e-mail message.
My e-mail address is Gisela.Ahlbrandt@emich.edu
My WWW-Page is [http://www.emunix.emich.edu/~gisela/](http://www.emunix.emich.edu/~gisela/)

**Office hours**
- MW: 1:00-1:50,
- MW 4:30-5:20
- Other hours by appointment
Information about the Textbook
The Text comes in various formats. The cheapest is the bundle of the homework-system with the e-book for $75 directly from WebAssign. The e-book is extensive and has videos and lots of support. You can even supplement this with an old textbook if you like to have a hard copy around. The next version is the Hybrid Edition with Access Code. ISBN 9781133110835 for $124 from the bookstore. Prices may vary for this from other sources.

Information about WebAssign
WebAssign is an online homework system. You can also purchase the access code either alone or together with the e-book directly from the WebAssign website. Starting on September 5, 2012 you can self enroll into the WebAssign. For this you will need to use the following Class Key: emich 7279 2028.
Use the following links for further information:
http://www.emunix.emich.edu/~gisela/m223/WA_Student_Quick_Start.pdf
http://www.emunix.emich.edu/~gisela/m223/FDOC_self_enrollment.ppt.pps
Let me know if you have questions or concerns.

Academic Honesty
I expect all students to abide by the University’s code of conduct, and in particular to abide by rules concerning academic honesty. In order to assess how the class is going and what you have learned, I need to see your own work: your own words and the details of your own computations. You may work with other students or math tutors on your assignments, but you must do an independent write-up. I will give failing grades for academic dishonesty.

Special Needs
If you have a learning disability or other physical impairment that may affect your ability to do the work in this course, please let me know as soon as possible so that we can make appropriate arrangements.