Math 2850-004 Elementary Multivariable Calculus Syllabus Spring 2013

Time and Location: MTRF 1:00-1:50 PL 2450
Instructor: Seung-Moon Hong, UH2030M, (419)530-2804, seungmoon.hong@utoledo.edu
Office hours: M 2:00-5:00, W 12:30-2:30

Textbook: *Thomas' Calculus Early Transcendentals*, 12th edition by George B. Thomas, Maurice D. Weir and Joel Hass. The textbook is available online at a 30% discount in electronic form from www.coursesmart.com. In this case, students will be responsible for printing it or accessing it electronically.
Prerequisites: Passing grade in Math 1860 or Math 1840. Students who enroll in math 2850 but have not passed either prerequisite may be administratively dropped from the class.
Resources: There are resources available for students who need extra help outside my office hours. For this course the most reliable source of tutorial help can be found at the Mathematics Learning and Resource Center, B0200, located in the basement of Carlson Library-phone ext. 2176. For MLRC hours, see http://www.utoledo.edu/utlc/lec/tutoring/math.html.

Homework: It will be assigned and graded weekly. Late homework will not be accepted for any reason. To allow some unexpected cases, 1-2 of the lowest assignment scores will be dropped.
Quizzes: There will be a quiz weekly. Some will be announced and some will not. No late quiz is accepted. At the end of the semester, 1-2 of the lowest quizzes will be dropped.
Exams: There will be two in class exams and a comprehensive final exam given during scheduled final exam period for the section.

Calculator: No calculators with symbolic or graphing capabilities are allowed on quizzes and exams.
Cell Phones and Laptop Computer Usage: Please turn off your cell phone and keep it stored away. You can use a laptop computer to take notes, but it cannot be used for any other purpose.
Attendance: Your attendance to all classes is strongly encouraged. Any announcements made in class regarding the schedule of future classes, exams or other information takes precedence over this outline.
Missed Quizzes and Exams: If you miss a class you are responsible for obtaining the material, notes, etc. Absence for quizzes and exams can only be excused if covered by the University's missed class policy. The policy specifically mentions absences from class may be excused for personal emergencies, religious observances, participation in certain UT sponsored activities, and government required activities. For more information see http://www.utoledo.edu/facsenate/missed_class_policy.html. The student must contact me in advance by phone, e-mail or in person, provide official documentation to back up his or her absence, and arrange to make up the missed item as soon as possible.
Drop/Withdrawal: The last day to drop or add this course is the Friday of the second week of classes. The last day to withdraw from this class with a grade of W is the Friday of the tenth week of classes.
Academic Honesty:Successful completion of this course requires personal integrity and honest academic effort. Any dishonest activities will not be tolerated in this course. Any student who engages in dishonest behavior will, at the instructor's discretion, fail the exam, fail the course, or more serious consequences. See the University's "Policy Statement on Academic Dishonesty".

Non-Discrimination Policy: The University of Toledo is committed to a policy of equal opportunity in education, affirms the values and goals of diversity.
Students with Disabilities: The University will make reasonable academic accommodations for students with documented disabilities. Students should contact the Office of Accessibility (Rocket Hall 1820; 419.530.4981; officeofaccessibility@utoledo.edu) as soon as possible for more information and/or to initiate the process for accessing academic accommodations. For the full policy see: http://www.utoledo.edu/utlc/accessibility/faculty.html

Learning objectives:

Upon successful completion of this class a student should be able to:

1. Differentiate and integrate vector-valued functions.
2. Evaluate limits and determine the continuity and differentiability of functions of several variables.
3. Describe graphs, level curves and level surfaces of functions of several variables.
4. Find partial derivatives, directional derivatives, and gradients and use them to solve applied problems.
5. Find equations of tangent planes and normal lines to surfaces that are given implicitly or parametrically.
6. Use the chain rule for functions of several variables (including implicit differentiation)
7. For functions of several variables, find critical points using first partials and interpret them as relative extrema/saddle points using the second partials test. Find absolute extrema on a closed region. Apply these techniques to optimization problems.
8. Use Lagrange multipliers to solve constrained optimization problems.
9. Evaluate multiple integrals in appropriate coordinate systems such as rectangular, polar, cylindrical and spherical coordinates and apply them to solve problems involving volume, surface area, density, moments and centroids.
10. Find the curl and divergence of a vector field, the work done on an object moving in a vector field, and the flux of a field through a surface. Use these ideas to solve applied problems.
11. Introduce and use Green's Theorem, the Divergence (Gauss's) Theorem and Stokes' Theorem.

Grading: The following percentages are assigned to the components of the student's grade.
Homework 15%, Quizzes 15%, Exam I 20%, Exam II 20%, Final Exam 30%.

The final letter grade will be based on your total average as follows:

Total average	60% or above	70% or above	80% or above	90% or above
Grade	D	C	B	A

Calendar:

Last day to add/drop	Jan 18
Exam I	Feb 08
Exam II	Mar 15
Last day to withdraw	Mar 22
Final Exam	May 01, 12:30-2:30

Schedule:

Week	Subject
1	13.1 Curves in space and their tangents
	13.2 Integral of vector functions
	13.3 Arc length in space
2	14.1 Functions of several variables
	14.2 Limits and continuity in higher dimensions
	14.3 Partial Derivatives
3	14.4 The Chain rule
	14.5 Directional derivatives and gradient vectors
4	14.6 Tangent planes and differentials
	14.7 Extreme values and saddle points
5	14.8 Lagrange multipliers
	Exam I
6	15.1 Double and iterated integrals over rectangles
	15.2 Double integrals over general regions
7	15.4 Double integrals in polar form
	15.5 Triple integrals in rectangular coordinates
8	15.6 Moments and centers of mass
	15.7 Triple integrals in cylindrical and spherical coordinates
9	16.1 Line integrals
	Exam II
10	16.2 Vector fields and line integrals: work, circulation and flux
11	16.4 Green's theorem in the plane
12	16.5 Surfaces and area
13	16.6 Surface integrals
14	16.7 Stokes' theorem
15	16.8 The divergence theorem and a unified theory