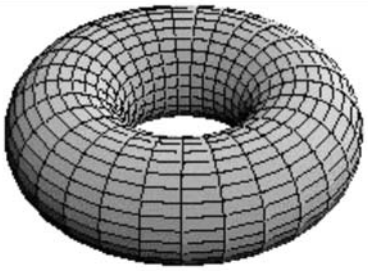
Math 18.02 - Concourse: Multivariable Calculus - Fall 2011

Lectures by: Robert Winters **Office**: 16-137 **Office phone:** x3-2050 (e-mail is better) **E-mail address**: rwinters@mit.edu	**Recitations by**: Lucas Culler **Office**: 2-587 and Concourse Lounge **Phone**: x3-4129 **E-mail**: luccul@mit.edu
Lecture times: Tues, Thurs 1:00-2:30pm in 16-160	**Recitation times**: Mon, Wed 2:00pm to 3:00pm in 16-160
Office hours: Tuesday 2:30-3:30pm; Thursday noon-1:00pm and at other times to be determined.	**Office hours**: to be determined

Prerequisites: Math 18.01 or equivalent (one-variable Calculus).

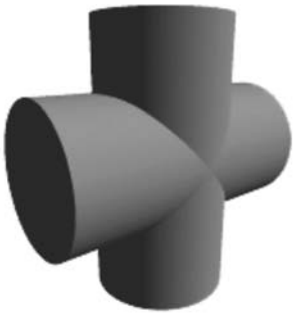


Texts: ***Multivariable Calculus, 6th Edition*** by Edwards & Penney (ISBN 0130339679). Also, we'll be drawing from the ***18.02 Notes & Exercises*** authored by Prof. Arthur Mattuck in the MIT Mathematics Department and developed over many years. These will be available as downloadable PDF files.

Website: http://math.rwinters.com/1802. Homework assignments, solutions, supplements, and anything that needs posting for the course will be found at this website. We will also have a Stellar site for other administrative matters as well as a link to the active website.

Homework: Homework will be posted on the course website and will be due approximately weekly. Exact due dates will be indicated in the Course Calendar accessible from the website. Typical assignments will include some exercises that are to be turned in as well as additional practice problems. Some of the exercises will be drawn from the text(s), but a typical problem set will contain both text exercises plus additional exercises. Homework may be submitted in class or at my office, but it should be completed by the posted due date. You should not consult any solutions manual or similar sources in preparing your assignments. You are encouraged to work with your fellow students on the homework, but your written solutions must be your own. Solutions will be made available (as PDF files) on the course website shortly after they are due.

Exams: We anticipate 4 midterm exams corresponding approximately to the four chapters of the text (tentatively Sept 27, Oct 25,
Nov 15, and Dec 6). There will also be a Final Exam. The intention is to have our exam dates correspond closely with the mainstream 18.02 exam dates.



Grading: (This scheme is preliminary and may be adjusted slightly)
Homework assignments – 30%
Midterm exams – 40% (we anticipate assigning less weight to your lowest exam score)
Final exam – 30%

Condensed Syllabus: (See the Calendar for day-by-day details, updated as the course proceeds.)

The text for the course is
Multivariable Calculus
6th edition
by Edwards & Penney
ISBN 0130339679 for softcover edition

- Vectors and vector algebra in $\mathbf{R}^2$ and $\mathbf{R}^3$; dot product, cross product, projection, equations of lines and planes. Matrix methods.(Chap. 12)
- Parameterized curves and surfaces in $\mathbf{R}^2$ and $\mathbf{R}^3$; velocity and acceleration vectors; tangent vectors; arclength. (Chap. 12)
- Functions of several variables - limits, continuity, and differentiabilty; partial derivatives, gradients, linear approximation, directional derivatives, Chain Rule. (Chap. 13)
- Optimization - unconstrained and constrained. (Chap. 13)
- Integration over regions in $\mathbf{R}^2$ and $\mathbf{R}^3$ and their applications, using Cartesian, polar, cylindrical, and spherical coordinates. (Chap. 14)
- Vector fields and their applications. (Chap. 15)
- Integration over curves in $\mathbf{R}^2$ and $\mathbf{R}^3$ by parameterization; work integrals, and applications. (Chap. 15)
- Integration over surfaces in $\mathbf{R}^3$ by parameterization - flux integrals, surface area, and applications. (Chaps. 14, 15)
- Calculus of vector fields; curl and divergence of vector fields; Green's Theorem, Stokes' Theorem, and the Divergence Theorem. (Chap. 15)