WEEK 13:

Class 31: *Monday, November 21*

Multivariable Functions: Vertical Slices

Most optimization problems involve functions of several variables. To begin to get a handle on functions of two variables, we will look at "vertical slices" of them. Setting one of the variables to a fixed value, we have a function of the one remaining variable. We will refer to this single-variable function as a "vertical slice" of the original two-variable function.

Homework F: Handout given in class. (Due Friday, Dec. 2)

Lab: *Monday, November 21 and Tuesday, November 22.*

Visualization of Multivariable Functions

Homework on Optimization Due in the Math 114 Homework Box by 5 pm

THANKSGIVING BREAK *Wednesday, November 23-Friday, November 25*

WEEK 14:

Class 32: *Monday, November 28*

Introduction to Partial Derivatives

The derivative of a vertical slice is referred to as a *partial derivative* of the function of two variables. As we will see in the coming weeks, partial derivatives are useful for locating extreme points of a function of two variables. If $f(x, y)$ is a function of two variables, then equations of the form $f(x, y) = c$, where c is a constant, *implicitly* define sets in the x, y-plane. These sets generally take the form of curves, in which case they are referred to as "level curves" of f. These are the sorts of curves you see on a topographic map, and correspond to *horizontal slices* through the surface graph of the function. A collection of level curves for a function is called a *contour plot* for the function. A contour plot is a useful alternative to a surface graph for visualizing a function of two variables.

Homework F: Handout given in class. (Due Friday, Dec. 2)

Lab: *Monday, November 28 and Tuesday, November 29.*

Review for Exam

Exam 3 *Tuesday, November 29, 7 pm; 301-302 Fowler*

Class 33: *Wednesday, November 30*

Multivariable Optimization

In this class we will consider optimization problems for functions of two variables, assuming that the domain for our function is unrestricted. The key idea will be to extend the concept of a "critical point" from functions of one variable to functions of two variables. Provided the function is differentiable everywhere, local maxima and minima will be found among these critical points. Contour plots are an important tool in distinguishing critical points that are local maxima or minima from those that are saddle points.

Homework F: Handout given in class. (Due Friday, Dec. 2)
Take Home Quiz handed out in class

No Class on Friday, December 2
Homework F still due in Math 114 Course Box by 5 pm

WEEK 15:

Class 34: *Monday, December 5*

Semester Review

Project Presentations: *Tuesday, December 6 and Wednesday, December 7*

A sign up sheet for project "block" presentation times will be outside of Professor Gallegos' door starting Monday, November 28–please sign up as soon as possible.

THE END!

Final Exam: *Wednesday, December 14, 6:30-9:30 pm*

Reminder: Your final exam score can replace another exam score if it helps you.