**Week 7 (Mar 11 – 15, Lectures 13 and 14) Teaching and Learning**

**Topics**

**14.1**: Open sets, closed sets, and boundaries of a set in the 2- and 3-dimensional space; real-valued functions with two or three real variables and their graphs; level curves and level surfaces. (Could outline the generalization to the n-dim spaces.)

**14.2**: Limits of multi-variable functions and their basic properties; limits along paths (curves); nonexistence of limits (“two-path test”); continuity.

**14.3**: Definition and calculation of partial derivatives; second-order partial derivatives and the mixed-derivative theorem (Clairaut’s theorem); partial derivatives and continuity; differentiability: definition, a sufficient condition (corollary of theorem 3), and its implication to continuity (theorem 4).

(It is OK to go a bit faster than this; but aim not to be slower.)

**Assignment 7\***

14.1, #7,15,20,28,31-36,40,43,58,62,65

14.2, #10,17,24,37,43,47,50,56,61,64,68

14.3, #19,21,31,39,43,54,60,64,66,72,78,86

This assignment is for practice only and no submission is required to help with students’ midterm preparation; it will not be graded.