Topics for Exam 2

1. **Continuous Functions**

    1.1 Compositions of Continuous Functions

    1.2 Limits and continuity

2. **Differentiability**

    2.1 Definition of differentiability

    2.2 The derivative as a linear approximation

    2.3 Derivatives of vector valued functions

    2.4 Derivatives of scalar fields

        i. The gradient
        ii. Partial derivatives
        iii. Directional derivatives

    2.5 Sufficient conditions for differentiability; C^1 functions.

    2.6 The Jacobain matrix

    2.7 Differentiability of Compositions: The Chain Rule

Relevant chapters and sections in the text: Section 7.1 on *Limits,* Section 7.3 on *Directional Derivatives,* Section 7.4 on *The Derivative,* and Section 7.6 on *The Chain Rule.*

Relevant chapters in the online class notes: Sections 3.3.3 and 3.3.4, and Chapter 4.

Important Concepts: Continuous function and limits, differentiable function, gradient, directional derivative, C^1 maps.

Important Skills: Know how to show that a function is differentiable; know how to compute the derivative map of a function; know how to apply the Chain Rule.