

**Topics for Exam 1****1. Euclidean Space**

- 1.1 Definition of  $n$ -Dimensional Euclidean Space
- 1.2 Spans, Lines and Planes
- 1.3 Dot Product and Euclidean Norm
- 1.4 Orthogonality and Projections
- 1.5 The Cross Product in  $\mathbf{R}^3$

**2. Continuous Functions**

- 2.1 Vector fields, scalar fields and paths
- 2.2 Definition of continuous function
- 2.3 Compositions of Continuous Functions
- 2.4 Limits and continuity

**3. Differentiability**

- 3.1 Differentiability of paths

**Relevant sections in the text:** Sections 1.2, 2.1, 2.3, 2.5, 4.1 and 4.2.

**Relevant chapters in the online class notes:** Chapters 2, 3 and Section 4.5.1.

**Important Concepts:** Euclidean space, dot product, orthogonal projections, cross product, continuous function, derivative of a path.

**Important Skills:** Know how to compute projections; know how to find equations of lines and planes; know how to show that a function is continuous or not; know how to compute the derivative of a path.