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Syllabus Mathematics III: Part I

In this course we will study change in continuous and in discrete time. In particular, we will learn about ordinary differential and difference equations, both first- and second-order, linear and non-linear. We will learn how to interpret and solve these equations, what their qualitative properties are (existence and uniqueness, stability of solutions) and how to analyze them using graphical methods when closed-form solutions are not possible. Finally, we will use our knowledge from linear algebra to solve systems of differential and difference equations.

Literature:

Further Mathematics for Economic Analysis, Sydsaeter, Hammond, Seierstad and Strom, Chapters 5,6 and 11

Differential Equations and Linear Algebra, Strang (I will make relevant material available), Chapters 1-3.

As an introduction: Chapters 24,25 and 23 in Simon and Blume

Good to read as review/prerequisite:

Chapters in Simon and Blume on complex numbers, trigonometric functions and Integral Calculus A2, A3, A4.