

First Order Linear ODE's: Introduction

Linear equations are the most basic and probably the most important class of differential equations. They will be the main focus of this course.

In this session we will introduce *first order linear ordinary differential equations*. That's a long name, so we will typically shorten it to "*first order linear equations*" or "*first order linear ODE's*". In later sessions we will look at higher order linear equations.

After defining first order linear ODE's, we will spend some time introducing the terminology that is used to describe them. In particular, we will borrow the language of *systems and signals* from engineering. Along the way we will see some examples of physical systems modeled by first order linear equations. Finally, we will state and prove the *superposition principle*. This principle is not difficult, but it is very important. We will show you several examples of superposition and remind you of its importance several times in this session.

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