Differential/Difference Equations

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Prerequisite: A first course in Differential Equations

We will be concerned with problems that come up in Differential Equations and Difference Equations. One of our interests will be to see how these two theories can be unified. For example calculus is very useful in Differential Equations and when one studies Difference Equations one of the first things that is done is to study an analogous discrete calculus. The discrete calculus and the continuous calculus can be unified in such a way that it includes a more general calculus. Consequently we get a generalization of difference equations and differential equations. We study dynamic equations, where differential equations and difference equations are special cases. This leads to many interesting open questions which we will consider. Any student interested in Differential Equations should enjoy this experience. About a fourth of our time will be spent studying Difference Equations so knowledge of Difference Equations is not a prerequisite.