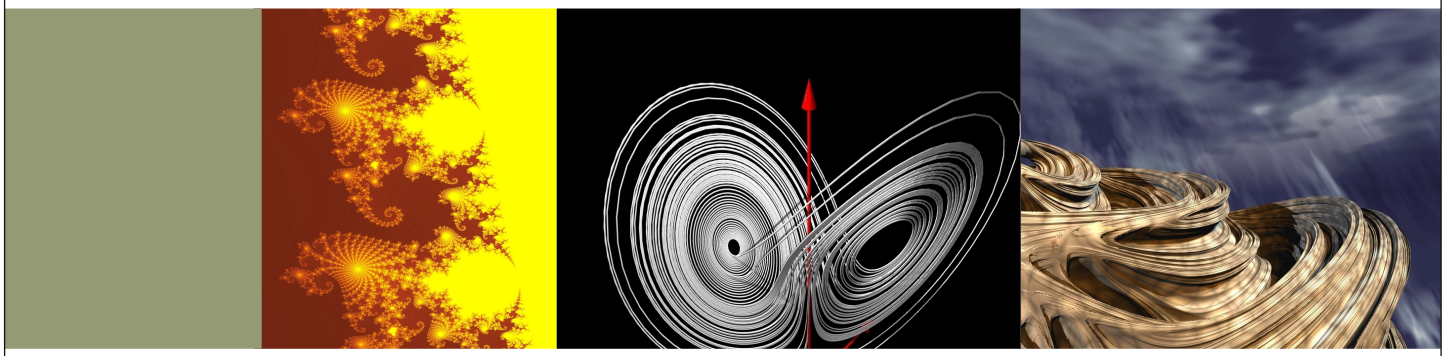
Unit MTH301 Nonlinear Dynamical Systems

This unit concerns the qualitative analysis of nonlinear dynamical systems. It builds on the knowledge and techniques developed in the Level 2 prerequisite unit on Dynamics.



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Dynamical systems are all around us; whenever a quantity is changing over time according to some rule or process we have a dynamical system.

In the case where time is changing continuously, these systems are often written in the form of a system of ordinary differential equations (ODEs). Rather than look for exact solutions to these systems, which is usually impossible in practice, Dynamical Systems Theory instead takes a qualitative and geometrical approach - what kind of solutions do we have, and what kind of shapes do these solutions create in the space of all possible solutions?

Mathematics is not a spectator sport: In addition to the lectures and handouts, you will be expected to supplement your studies by looking at the literature, including the recommended books, by attempting to derive for yourself all computations and proofs seen in the lectures, and by attempting exercises both from the recommended books and from the exercise sheets distributed during the lectures and on the WebCT site for the unit.

Printed notes will be distributed, but most students do better when they create their own notes, perhaps in summary form.

Further information
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