

Analysis

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Lectures Thursdays 9–10 and 2–3 in Maxwell, Fridays 12–1 in EELT3.

Tutorials Every other week, starting either next week or the week after.

Topics We will cover the following topics, yet not necessarily in the order listed.

- A short introduction to mathematical logic and proofs
- Definition and properties of min/max/inf/sup
- Logarithms, powers and roots
- Definition and properties of limits; limits at infinity
- Definition and properties of derivatives
- Definition of continuity; continuous and discontinuous functions
- Bolzano, Intermediate value and Mean value theorems
- Applications of derivatives in optimization problems
- Definition and properties of (in)definite integrals
- Techniques of integration; the Fundamental Theorem of Calculus
- Infinite and power series; tests for convergence
- Taylor's Theorem; binomial and exponential series
- Applications of integrals in computations of area
- Surfaces of revolution and their volumes

Textbook A large part of the course is based on the book *Calculus* by Michael Spivak. You do not have to buy this book, as I plan to provide brief notes on everything we cover.

Homework Homework assignments will be handed out in class every other week.

Marks 20% homework, 80% final exam.

Web page Notes, homework assignments and solutions will be posted on the web page

<http://www.maths.tcd.ie/~pete/analysis>