Maths 121 – Analysis

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Lectures Thursday 2-3 in Joly and 3-4 in EELT2; Friday 1-2 in Maxwell and 2-3 in LB8.

Tutorials Friday 9-10 in 4050B (for TP students) and Salmon (for everyone else).

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

- A short introduction to mathematical logic and proofs
- \bullet 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
- Partial derivatives, double integrals and Fubini's Theorem
- **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 10% homework, 20% Christmas exam, 20% Easter exam, 50% final exam.

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

http://www.maths.tcd.ie/~pete/ma121