LTCC Basic Course

Title: Graph Theory

Basic Details:

- Core Audience: pure mathematics, 1st yr (although suitable for all students at any year)
- Course Format: 5 x 2hr lectures

Course Description:

- Keywords: Graph colouring. Planar graphs. Topological graph theory. Graph minors. Ramsey Theory. Random graphs. Algorithmic and complexity aspects. Extremal graph theory. Probabilistic method.

- Syllabus: Our aims in this course are twofold. First, to discuss some of the major results of graph theory, and to provide an introduction to the language, methods and terminology of the subject. Second, to emphasise various approaches (algorithmic, probabilistic, etc.) that have proved fruitful in modern graph theory. These modes of thinking about the subject have also proved successful in other areas of mathematics, and the skills learnt in this course should be transferable to other areas of mathematics.

- Recommended reading:
    - Reinhard Diestel, *Graph Theory*. 5th edition (2017) is recommended. See diestel-graph-theory.com for several (downloadable) versions.
- Additional Optional reading:
    - J.A. Bondy & U.S.R. Murty, *Graph Theory* (2008).
    - Béla Bollobás, *Modern Graph Theory* (2nd edition 2001, or 3rd edition 2002).
      I expect that most universities allow their students to access these books electronically.

- Prerequisites: None

Format:

- No of problem sheets: five (all electronic notes contain exercises); and five solution sets.
- Electronic lecture notes: five.

Lecturer Details:

- Lecturer: Professor Julia Boettcher
- Lecturer home institution: London School of Economics & Political Science
- Lecturer e-mail: j.boettcher@lse.ac.uk
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