School of Mathematics

Module MA442C — Banach algebras 2009-10
(SS Mathematics, SS Two-Subject Moderatorship)

Lecturer: Dr. Rupert Levene

Requirements/prerequisites: prerequisite: 321

Duration: Michaelmas term, 11 weeks

Number of lectures per week: 3 lectures including tutorials per week

Assessment:

End-of-year Examination: 2 hour examination in Trinity term.

Description:

1. Introduction to Banach algebras
   - Definition and examples
   - invertibility
   - the spectrum
   - quotients of Banach algebras
   - ideals, quotients and homomorphisms.
2. Weak topologies
   - Subbases and weak topologies
   - The product topology and Tychonoff's theorem.
   - The weak* topology and the Banach-Alaoglu theorem.
3. Unital abelian Banach algebras
   - Characters and maximal ideals
   - The Gelfand representation.
4. C^*-algebras
   - Definitions and examples
   - The Stone-Weierstrass theorem
   - Abelian C^*-algebras and the continuous functional calculus.
   - Positive elements of C^*-algebras
   - the GNS representation.

The treatment will be based in part on some of the book: Gerard J. Murphy, C^*-Algebras and Operator Theory, Academic Press, (1990).

March 4, 2010