

MATH 5003 — Banach Algebras

Fall 2018, Carleton University

Professor: Charles Starling

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Office Hours: By appointment. (Tuesday/Thursday)

Prerequisite: Permission of the school.

For this course, I assume you have a good background in real and complex analysis, point-set topology, and elementary functional analysis. If you have any doubts, please contact me.

Lectures: Tuesdays and Thursdays, 14:35–15:55 in Paterson Hall, room 129.

Evaluation: Your grade in this course will be determined by graded assignments only. There is no final exam or midterm exam.

Text: Your main reference should be your in-class notes. While there is no main text, I will be roughly following the development given in these two sets of notes:

- *Banach Algebras and Abstract Harmonic Analysis – A Contemporary Approach*, Z. Hu, M. Neufang and V. Runde, Prebook, 2013.
- *Lecture Notes on C^* -algebras*, I. F. Putnam, 2016.

Additional reading (not required):

- *C^* -algebras and Operator Theory*, G. J. Murphy, Academic Press, Boston, MA, 1990.
- *Analysis Now*, Gert K. Pedersen, Graduate Texts in Mathematics, 118, Springer-Verlag, New York, 1989.
- *C^* -algebras by example*, K. Davidson, Fields Inst. Monographs, vol 6, American Math. Soc., Providence, RI, 1996.

Approximate course content:

Banach Algebras

- Definition and examples
- The spectrum and spectral radius
- The Gelfand transform

C^* -algebras

- Commutative C^* -algebras
- Positivity
- Ideals, quotients, and $*$ -homomorphisms
- Traces
- Representations
- The GNS construction

Time permitting, further topics could include von Neumann algebras, group C^* -algebras, and AF-algebras.

Academic Accommodation: Students with disabilities requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Students must confirm their need for accommodation with the Instructor no later than one week before the first quiz. If students require special arrangements to meet their academic obligations, please review the course outline and write me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist.

Pregnancy or Religious Obligation: Please email me requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the Student Guide.