Department of Mathematics & Statistics
Concordia University

MAST 662(MAST 837), Sec. C
Functional Analysis
Fall 2018

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Office Hours: TBA

Topics: The course is devoted to the basics of the Functional Analysis. It covers the following topics:

1. Metric spaces. Completeness and Baire theorem. Contractions. Some applications to real analysis and differential equations.

2. Banach spaces. Linear operators in Banach spaces. Compact operators. Banach-Steinhaus theorem, closed graph theorem, open map theorem, Banach inverse operator theorem, Hahn-Banach theorem, Duality.

3. Hilbert spaces. Bounded linear operators in Hilbert space. Spectral theorem for compact self-adjoint operators. Sturm-Liouville theory. Fredholm theory. Applications to integral equations.

Recommended literature:

1. Reed M., Simon B., Functional Analysis. Methods of Modern Mathematical Physics, vol. 1
2. Lax P. Functional analysis
3. Any other course in basic functional analysis available for free download,
   see, e.g., http://www.freebookcentre.net/Mathematics/Functional-Analysis-Books.html

Grading scheme: 60% - Assignments, 40% - Presentation

Academic Integrity and the Academic Code of Conduct
This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: concordia.ca/students/academic-integrity." *[Undergraduate Calendar, Sec 17.10.2]*