PMATH 453/753 - Fall 2017
Functional Analysis

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DESCRIPTION: Point-set topology, Banach spaces, duality, bounded linear operators, Fredholm theory and the spectral theorem for compact linear operators

PREREQUISITE: PMATH 450/650 or equivalent

TEXTBOOK: *A Course in Functional Analysis, 2nd Edition*
by John Conway
https://link.springer.com/book/10.1007%2F978-1-4757-3828-5

WEBPAGE: https://learn.uwaterloo.ca/d2l/home/300309

GRADING:

PMATH 453		PMATH 753	
Assignments	40%	Assignments	35%
Final Exam	60%	Talk	15%
		Final Exam	50%

ASSIGNMENTS: Assignments will be posted approximately biweekly.

FINAL EXAM: There will be a final exam scheduled by the university during the fall examination period.

NOTES: For any missed examination, you must have a valid reason and appropriate supporting documentation. Absence from the midterm exam will normally result in the weight being shifted to the final exam. To be considered for an incomplete (INC) grade, you must have done well on all term work.

Topic	Details
Point-set Topology	Basic introduction
Banach Spaces	Convexity, bounded linear maps
Duality	Weak topologies, Banach-Alaoglu theorem
Bounded Linear Operators	
Spectral Theorem	Linear functionals on spaces of continuous functions, Riesz-Markov-Kakutani representation theorem, regularity and approximation, Lusin's theorem

ACADEMIC INTEGRITY: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. See `http://www.uwaterloo.ca/academicintegrity/` for more information.

GRIEVANCE: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See Policy 70, Student Petitions and Grievances, Section 4 at `http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm`. When in doubt, please be certain to contact the department's administrative assistant, who will provide further assistance.

DISCIPLINE: A student is expected to know what constitutes academic integrity in order to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, an academic advisor or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to Policy 71, Student Discipline at `http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm`.

APPEALS: A decision made or a penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline, may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals at `http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm`.

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