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


2. Compact metric spaces. Examples, criteria of compactness. Peano theorem on the existence of solution of ODE with continuous RHS. Lower semicontinuous functionals; existence of a minimal geodesic on a surface in $\mathbb{R}^3$.


5. The weak and weak-* convergence in Banach spaces. The Alaoglou theorem.


Some topics are devoted to applications and extensions of the theory. They are intended for the students’ presentations. Here are some sample topics:

8. The Zorn lemma.
10. The Monge-Kantorovich Problem.
11. The Runge theorem.
12. The Kolmogorov $\varepsilon$-entropy.
13. The existence of a closed geodesic on a convex surface.
14. Applications of the Close Graph Theorem.
16. Uniform convexity and the reflexivity criterion.
17. The Krein-Milman Theorem.

Good presentations are counted as successful exams.

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]