

MAST 653 (MATH 630), Sec. BB
Topics in the Foundations of Mathematics
Winter 2019

Instructor: Dr. A. Shnirelman, Office: LB 927-17, Phone: (514) 848-2424, Ext. 5222
Email: alexander.shnirelman@concordia.ca

Office Hours: _____

Class Schedule: Mondays & Wednesdays, 16:15-17:30.

Topics: The Non-Standard Analysis (NSA) is a new mathematical discipline created by Abraham Robinson in 1960-s. The mathematical universe of NSA is immensely wider than that of the classical mathematics. It contains infinite and infinitesimal numbers, and much more. The NSA provides the tools of mathematical constructions which are infinitely more powerful than the classical ones. However, the use of NSA requires a strong logical discipline; not all the classical constructions are permitted there. We cannot form viable sets as freely as we are used to. The course is devoted to the systematic study of the basics of NSA from the beginning, i.e. the set theory and elements of mathematical logic. On this basis the fundamental notions of NSA are developed, like the Transfer Principle, Internal Sets, Overflow and Underflow, etc. By the end of the course I'm going to discuss some applications of NSA to the Geometry (Asymptotic spaces) and Dynamics, including some problems of Fluid Dynamics. The course does not require special prerequisites beyond the elementary set theory and analysis.

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*]