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# MATH 562 Theory of Machine Learning (4 credits)

Offered by: Mathematics and Statistics ([Faculty of Science \(/study/2022-2023/faculties/science\)](#))

## Overview

Mathematics & Statistics (Sci) : Concentration inequalities, PAC model, VC dimension, Rademacher complexity, convex optimization, gradient descent, boosting, kernels, support vector machines, regression and learning bounds. Further topics selected from: Gaussian processes, online learning, regret bounds, basic neural network theory.

**Terms: Winter 2023**

Instructors: Oberman, Adam (Winter)

- Prerequisites: [MATH 462 \(/study/2022-2023/courses/math-462\)](#) or [COMP 451 \(/study/2022-2023/courses/comp-451\)](#) or ([COMP 551 \(/study/2022-2023/courses/comp-551\)](#), [MATH 222 \(/study/2022-2023/courses/math-222\)](#), [MATH 223 \(/study/2022-2023/courses/math-223\)](#) and [MATH 324 \(/study/2022-2023/courses/math-324\)](#)) or [ECSE 551 \(/study/2022-2023/courses/ecse-551\)](#).
- Restrictions: Not open to students who have taken or are taking [COMP 562 \(/study/2022-2023/courses/comp-562\)](#). Not open to students who have taken [COMP 599 \(/study/2022-2023/courses/comp-599\)](#) when the topic was "Statistical Learning Theory" or "Mathematical Topics for Machine Learning". Not open to students who have taken [COMP 598 \(/study/2022-2023/courses/comp-598\)](#) when the topic was "Mathematical Foundations of Machine Learning".

*This course may be used as a required or complementary course in the following programs:*

[Bachelor of Science \(B.Sc.\) - Minor Statistics \(/https://www.mcgill.ca/study/2022-2023/faculties/science/undergraduate/programs/bachelor-science-bsc-minor-statistics\)](#)



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