

csc321 – Introduction to Neural Networks and Machine Learning

Prerequisites: Informally, calculus, linear algebra, statistics and programming.
Formally, CSC207H5/270H5, 290H5; MAT223H5/248Y5; STA257H5

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Classes: Wednesday 3–5pm, IB 210.

Tutorials: Tuesday 1–2pm, IB 210. Tutor: Yue Li. Tutorials may introduce new material not covered in the lectures or readings.

Web Page: <http://www.cs.toronto.edu/~bonner/courses/2012s/csc321/webpages>

Grading Scheme: Four assignments, 10% each; Midterm test, 20%; Final exam, 40%.
On all work, 20% of the mark will be for quality of presentation, including the use of good English. The final exam and midterm will be based on the assignments and will assume that you have completed them by yourself. Final marks may be adjusted up or down to conform with University of Toronto grading policies. Late assignments will not be accepted.

Readings: There is no required textbook for the class. There will be one or two required papers or chapters per week. These required readings will all be available on the course web page.

Topics Covered: Supervised neural networks: the perceptron learning procedure, the back-propagation learning procedure and its applications. Elaborations of backpropagation: activation and error functions, improving speed and generalization, Bayesian approaches. Associative memories and optimization: Gibbs sampling, mean field search. Representation in neural networks: distributed representations, effects of damage, hierarchical representations. Unsupervised neural networks: competitive learning, Boltzmann machines, sigmoid belief nets.

Plagiarism and Cheating: Students should become familiar with and are expected to adhere to the *Code of Behaviour on Academic Matters*, which can be found in the UTM Calendar.