

# 6.891 Machine Learning Approaches for Natural Language Processing

---

**Time:** MW 4-5:30pm  
**Location:** Room 1-379  
**Credit** 3-0-9 H-Level Graduate Credit  
**Prerequisites** 6.034 or permission of instructor  
**Instructor:** Prof. Michael Collins, Room NE43-723, MIT CSAIL/EECS  
mcollins@ai.mit.edu  
<http://www.ai.mit.edu/people/mcollins>

---

## Syllabus

- Introduction (1 lecture)
- Estimation techniques, and language modeling (1 lecture)
- Stochastic parsing (3 lectures)
- Stochastic tagging, and maximum entropy/log-linear models (2 lectures)
- The EM algorithm for PCFGs, HMMs, and machine translation (2 lectures)
- Information extraction (2 lectures)
- Machine translation (3 lectures)
- Vision and language (1 lecture)
- Dialogue systems (2 lectures)
- NLP issues in different languages,  
e.g., Czech, Chinese, Arabic, German (1 lecture)
- Word-sense disambiguation (1 lecture)
- Semi-supervised approaches (2 lectures)
- Discriminative/reranking approaches, and kernels over NLP structures  
(2 lectures)
- Learning in Optimality Theory (1 lecture)
- Conclusions/open problems (1 lecture)