This class provides an introduction of econometrics of high-dimensional models. The class will cover the following topics: 1) relevant results in probability theory (concentration and maximal inequalities); 2) estimation of linear high-dimensional models using Lasso, Dantzig selector, and related methods; 3) estimation of generalized linear high-dimensional models (e.g., quantile and logit regressions) using penalized M-estimators; 4) basics of machine learning (regression trees, random forests, neural networks); 5) semi-parametric inference in high-dimensional models via double machine learning; 6) related topics in econometrics such as grouped fixed effect estimators in panel data and many moment inequalities. Although the class will be primarily based on research papers, as a general reference, a highly recommended textbook is Wainwright (2019), High-dimensional statistics: a non-asymptotic viewpoint, Cambridge University Press.