“Less-than-Fully-Parametric Estimation” would be a more descriptive title for this course. Whereas Econometrics II (ECO392M.3) focuses primarily on fully parametric estimation using the method of maximum likelihood, this course will consider alternative estimation strategies that require fewer (or at least weaker) assumptions on the statistical model.

The course will cover a continuum of estimation strategies, from fully nonparametric methods to (almost) fully parametric methods. Emphasis will be on practical application, although some discussion of theory is required to avoid pitfalls. Nonetheless, this will not be a theorem/proof class (despite the official title, which seems impossible to change due to bureaucratic inertia).
(Tentative) Course Outline:

I. Introduction

II. Univariate Data Representation

III. Histogram Density Estimators
   A. Properties
   B. Equivalent Sample Sizes
   C. Data-Based Bin-Width Selection
   D. Multivariate Setting

IV. Kernel Density Estimators
   A. Properties
   B. Optimal Kernels
   C. Higher-Order Kernels
   D. How Hard is a Particular Density to Estimate?
   E. Density Derivative Estimation
   F. Bandwidth Selection
   G. Boundary Effects
   H. Multivariate Setting

V. Kernel Regression
   A. Bandwidth Selection
   B. Confidence Intervals
   C. Regression Derivatives
   D. Quantile Estimation
   E. Discrete Regressors
   F. Multivariate Setting

VI. Local Polynomial Regression
   A. Design Adaptation
   B. Boundary Effects
   C. Bandwidth Selection
   D. Multivariate Setting

VII. Bootstrap Estimation
   A. Confidence Intervals
   B. Bootstrapping Regression Models
   C. One-Sided Tests
   D. Parametric versus Nonparametric Fits

VIII. Estimating Productive Efficiency
   A. Theory of the Firm Revisited
   B. Set Estimators
   C. Distance Function Estimators
   D. Inference

IX. Survival Analysis