

**Theoretical and Empirical Aspects of Matching Markets**  
**Columbia University, Economics Department**  
SPRING 2011

**Instructor:** Alfred Galichon, email: alfred.galichon@gmail.com.

**Time and Location:** TBA.

**Texts:** No text is required. A worthwhile reading is Roth and Sotomayor, *Two-Sided Matching A study in Game-Theoretic Modeling and Analysis*, Cambridge.

**Grading:** Students taking this course for credit should write a paper relevant to an aspect of the course, to be discussed with the instructor. This course will be graded on a pass/fail basis.

### Description of the Course

The course will focus on the economic theory of matching from a number of points of view. It is intended to give the attendees an overview of the fundamental theory of the optimal assignment problem, as well as its application to various fields such as labor, family and transportation economics. A particular emphasis is put on the empirical aspects and identification issues, and the main matching algorithms will also be discussed. The last part of the course tries to make a link with matching games with nontransferrable (or partially transferrable) utility and attempts to provide a unified treatment.

Part I. The optimal assignment problem (10hrs)

1. The optimal assignment and the optimal transportation problem.
2. The social planner problem and welfare theorems.
3. Important special cases: univariate, discrete, Gaussian, quadratic cost.
4. Hedonic models.
5. Bargaining issues and the economics of the family.

Part II. Empirical aspects and computational aspects (8hrs)

6. Nonparametric estimation.
7. Parametric estimation.
8. Empirical determinants of marriage and friendship.
9. Algorithms and computational issues.

Part III. Non-transferrable utility (6hrs)

10. The stable marriage problem and the Gale-Shapley procedure.
11. Fractionally stable matchings.
12. Kidney exchanges and the “top trading cycles” procedure.

Part IV. Extensions and current research issues (4hrs)

13. Incorporating frictions and search.
14. Discrete utility transfers: Matching with contracts.