

Topics in Matching Theory

Georg Nöldeke and Larry Samuelson
Humboldt University, June-July 2023

This short course consists of four lectures on the equilibrium analysis of one-to-one matching models.

The first lecture introduces the formal framework and discusses conditions for the emergence of positive assortative matching in models with transferable, non-transferable, and imperfectly transferable utility.

The second lecture focusses on matching under transferable utility, in which equilibrium matching patterns and payoffs can be determined by the solution to an optimal transportation problem and its dual. It is shown how these methods can be extended to study equilibria in hedonic models, in which agents not only care about their matching partner and transfers but other economic decisions shaping their relationship.

In many situations individuals make investment decisions with a view towards enhancing their outcome in a competitive matching market. The third lecture incorporates such investment choices into the matching models considered so far and discusses conditions under which such investment choices will lead to (in)efficient outcomes.

Building on the discussion of the optimal transportation duality in the second lecture, the fourth lecture develops a more general “equilibrium transportation” duality relationship and shows how this duality can be applied to study equilibria in matching under imperfectly transferable utility.

Lecture 1: Introduction and Basic Notions

Tuesday, June 27, 14:15 to 15:45, Georg Nöldeke

1. Pierre-André Chiaporri, *Matching with Transfers: The Economics of Love and Marriage*. Princeton: Princeton University Press, 2017. [Chapters 1 and 2]
2. Alvin E. Roth and Marilda O. Sotomayor, *Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis*. Cambridge: Cambridge University Press, 1990. [Chapters 2,3,8, and 9]

Lecture 2: Matching under Transferable Utility, Optimal Transport, and Hedonic Pricing

Thursday, June 29, 14:15 to 15:45, Georg Nöldeke

1. Pierre-André Chiaporri, *Matching with Transfers: The Economics of Love and Marriage*. Princeton: Princeton University Press, 2017. [Chapter 3]
2. Alfred Galichon, *Optimal Transport Methods in Economics*. Princeton: Princeton University Press, 2016. [Chapters 2 and 4]

3. Brendon Pass, “Interpolating between Matching and Hedonic Pricing Models,” *Economic Theory* 67:393-419, 2019.

Lecture 3: Investment and Matching

Tuesday, July 4, 14:15 to 15:45, Larry Samuelson

3. Hal L. Cole, George J. Mailath and Andrew Postlewaite, “Efficient Non-Contractible Investments in Large Economies”, *Journal of Economic Theory* 101(2) (2001), 333-373.
4. Georg Nöldeke and Larry Samuelson, “Investment and Competitive Matching”, *Econometrica* 83(3) (2015), 835-896.
5. Alvin E. Roth and Marilda O. Sotomayor, *Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis*. Cambridge: Cambridge University Press, 1990, chapters 7-9.

Lecture 4: Equilibrium Transportation

Thursday, July 8, 14:15 to 15:45, Larry Samuelson

4. Alfred Galichon, *Optimal Transport Methods in Economics*. Princeton: Princeton University Press, 2016.
5. Georg Nöldeke and Larry Samuelson, “The Implementation Duality”, *Econometrica* 86(4) (2018), 1283-1324.