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Location: MUEN E131
Meeting Times: MWF 1:00-1:50
Office Hours: MWF 10:30 – 11:30
                            (or by appointment)

All course materials will be posted on the Canvas website that can be accessed at https://canvas.colorado.edu/.

Economists are increasingly involved not just in studying but in designing practical market mechanisms. These include auctions to sell diamonds, timber, electricity, procurement contracts and radio spectrum; matching algorithms to assign students to schools, or candidates to jobs; as well as marketplaces and mechanisms to sell internet advertising, trade financial securities, or reward innovation. The field of market design studies how to construct rules for allocating resources or to structure successful marketplaces. It draws on the tools of game theory and mechanism design to identify why certain market rules or institutions succeed and why others fail.
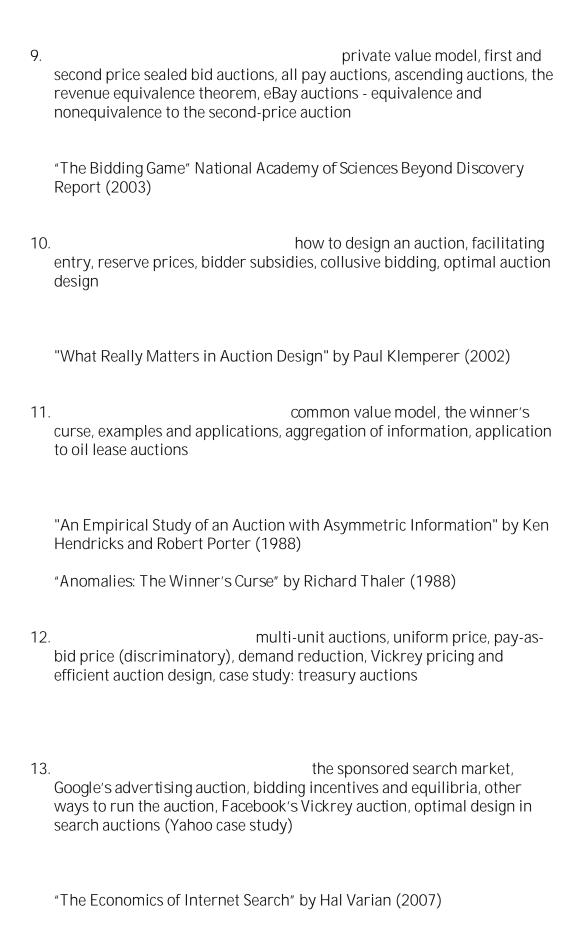
The course consists of thee parts. In the first part, we review the fundamental concepts from the game theory and develop strategic thinking. In the second part, we look at the "matching markets" that operate without prices, highly unusual for economics. Examples include assigning students to schools, assigning donor kidneys to transplant patients and college admissions. The third part of the class is on auctions and good auction design. Examples range from simple auctions used by eBay and Christie's to auctions used in financial markets, auctions used by Google, Facebook and Microsoft to sell advertising, and auctions used by government to sell large-scale complex assets such as radio spectrum.

A textbook for this class is "   " by   . Additional
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A book " " by
is a very famous book suitable for the Game Theory part of the class. A
book "

      c. Mixed Strategies & Dynamic Games (2.5 lectures)
      d. Bayesian Games and Mechanism Design (1.5 lectures)

4. Matching (weeks 5 - 9) (10 lectures)
      a. Two-Sided Matching (3 lectures)
      b. Two-Sided Applications (2 lectures)
      c. One-Sided Matching, Kidney Exchange (2 lectures)
      d. School Choice (3 lectures)

6. Auctions (weeks 9 – 16, 18 lectures)
      a. Auction Theory (5 lectures)
      b. Auction Design (3 lectures)
      c. Common-Value Auctions (

"College Admissions and the Stability of Marriage" by David Gale and Lloyd Shapley (1962)

6.   stable matchings and orderly markets, the problem of market unravelling, case study: medical residents and the NRMP, medical fellowships, law clerks, college admission

"What Have We Learned from Market Design" by Alvin Roth (2008)

"The Re-Design of the Matching Market for American Physicians: Some Engineering Aspects of Economic Design" by Alvin Roth and Elliott Peranson (1999)

7.   the House Allocation Problem, efficient outcomes and the core, serial dictatorship, the top trading cycles algorithm and its variations, kidney exchanges

"A Kidney Exchange Clearinghouse in New England" by Alvin Roth, Tayfun Sonmez and Utku Unver (2005)

"Kidney Exchange: A Life-Saving Application of Matching Theory" (2005)

8.   School Choice Problem, the Boston algorithm and its incentives, deferred acceptance and top trading cycles as alternatives, problem of ties, case studies: NYC and Boston

"The New York City High School Match" by Atila Abdulkadiro lu, Parag Pathak and Alvin Roth (2005)

"The Boston Public School Match" by Atila Abdulkadiro lu, Parag Pathak, Alvin Roth and Tayfun Sonmez (2005)

"School Choice" by Joseph Malkevitch

9.   private value model, first and second price sealed bid auctions, all pay auctions, ascending auctions, the revenue equivalence theorem, eBay auctions - equivalence and nonequivalence to the second-price auction

"The Bidding Game" National Academy of Sciences Beyond Discovery Report (2003)

10.   how to design an auction, facilitating entry, reserve prices, bidder subsidies, collusive bidding, optimal auction design

"What Really Matters in Auction Design" by Paul Klemperer (2002)

11.   common value model, the winner's curse, examples and applications, aggregation of information, application to oil lease auctions

"An Empirical Study of an Auction with Asymmetric Information" by Ken Hendricks and Robert Porter (1988)

"Anomalies: The Winner's Curse" by Richard Thaler (1988)

12.   multi-unit auctions, uniform price, pay-as-bid price (discriminatory), demand reduction, Vickrey pricing and efficient auction design, case study: treasury auctions

13.   the sponsored search market, Google's advertising auction, bidding incentives and equilibria, other ways to run the auction, Facebook's Vickrey auction, optimal design in search auctions (Yahoo case study)

"The Economics of Internet Search" by Hal Varian (2007)

"Online Advertising: Heterogeneity and Conflation in Market Design" by Jonathan Levin and Paul Milgrom (2010)

14.   Topics: electronic markets for trading equity and other financial securities, the use of auctions for IPOs, real-time trading and market clearing, competition between exchanges

"Concept Release on Market Structure" by SEC (2010)

"The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response" by Eric Budish, Peter Cramtom and John Shim

15.

accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#)

to academic materials, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at the Honor Code Office website.

The Office of Victim Assistance can be reached at 303-492-8855. Its http://www.colorado.edu/ova/.