FACULTAD DE CIENCIAS FÍSICAS Y MATEMÁTICAS UNIVERSIDAD DE CHILE

PROGRAMA DE CURSO

Código	Nombre
IN7512	Teoría de juegos y Diseño de mercados
Nombre en Inglés	

Créditos	Horas de Cátedra	Horas Docencia Auxiliar	Horas de Trabajo Personal
3	3	1.5	

Requisitos	Carácter del Curso
IN2201 / IN701	Electivo para el Magíster en Economía Aplicada.

Resultados de Aprendizaje

This is a short course on market design. In the last years, practitioners and academics have engineered the rules of a number of markets, including complicated auctions, school choice algorithms, and organ donation exchanges. As Nobel laureate Al Roth put it, market design recognizes that well-functioning markets depend on detailed rules. This course will cover some of the main theoretical results in market design. The course also covers applications to the design of real world markets for telecommunication spectrum, fishing rights, school choice, college admission, internet trading, dynamic price discrimination, electricity, and organ exchanges.

The course is intended to advanced students with interests in economics and related fields (finance, operations research, marketing, etc). The course assumes students have some background in game theory, probability theory, and optimization. The course will repeatedly introduce and apply game theory concepts. You are expected to be familiar with concepts such as Nash equilibrium.

Metodología Docente	Evaluación General
We will assign one project. Students are expected to present papers. The course has a final exam. The following textbooks are recommended. 1. Auction: Theory and Practice, Paul Klemperer 2003. 2. Putting Auction Theory to Work, Paul Milgrom 2004. 3. Two-Sided Matching, Alvin Roth and Marilda Sotomayor 1990.	The final grade will be computed as F = 30%HW + 30% presentation + 40%Exam.

Unidades Temáticas

Contenidos

The following is the list of some of the topics covered

1) Auctions and mechanism design
   - The VCG mechanism
   - The mechanism design problem and the revelation principle
   - Revenue equivalence theorem (Myerson 1981)
   - Optimal auctions and the monopoly problem (Bulow 1989)
   - Common value auctions, affiliation, the linkage principle (Milgrom and Weber 1982)

- Correlated types (Cremer and McLean 1988)
- Robustness and variations: Discrimination (Deb and Pai 2017), approximation (Hartline 2012), general information structure (Bergemann, Brooks, and Morris 2017), auctions with resale (Zhoucheng 2002, Carroll and Segal 2018)
- Examples and applications: efficient bargaining (Myerson and Satterthwaite 1983), optimal regulation (Baron and Myerson 1982), auctions versus negotiations (Bulow and Klemperer 1994), collusion with incomplete information and price rigidities (Athey, Bagwell, and Sanchirico 2004), security auctions (DeMarzo, Kremer, and Skrzypacz 2005), generalized war of attrition (Bulow and Klemperer 1999), auctions with externalities (Jehiel, Moldovanu, and Stacchetti 1996), inter- net auctions (Edelman, Ostrovsky, and Schwarz 2007), redistribution through markets (Dworczak, Kominers, and Akbarpour 2021)

2) Commitment, bargaining, and the Coase conjecture
- Fudenberg and Tirole (1983), Fuchs and Skrzypacz (2010), Board and Pycia (2014)
- Bargaining and commitment types: Abreu and Gul (2000)
- Bargaining and non-common priors: Yildiz (2003)
- Auctions with limited commitment: Skreta (2015), Liu, Mierendorff, Shi, and Zhong (2019), Doval and Skreta (2018)

3) Matching markets
- Matching theory, stable matching, efficiency, deferred acceptance, top trading cycles, serial dictator, strategy proofness, algorithms, large markets: Gale and Shapley (1962), Abdulkadiroˇglu and S¨onmez (2003), Roth and Sotomayor (1990), Azevedo and Leshno (2016)
- Applications and examples to School choice, organ exchange, reserve design: Abdulkadiroˇglu, Pathak, and Roth (2009), Hafalir, Yenmez, and Yildirim (2013)

4) Multiunit and combinatorial auctions
- Milgrom (2004), Ausubel and Milgrom (2006), Ausubel, Cramton, Pycia, Rostek, and Weretka (2014), Cramton (2013), Milgrom and Segal (2019)

5) Dynamic mechanism design and pricing
- Pavan, Segal, and Toikka (2014), Board and Skrzypacz (2016), Garrett (2016), H¨orner and Samuelson (2011), Stokey (1979)

Bibliografía General

- ABDULKADIROGˇLU, A., P. A. PATHAK, AND A. E. ROTH (2009): "Strategy-Proofness versus Efficiency in Matching with Indifferences: Redesigning the NYC High School Match," American Economic Review, 99(5), 1954–78.
- ABDULKADIROGˇLU, A., AND T. SO¨NMEZ (2003): "School Choice: A Mechanism Design Approach," Amer- ican Economic Review, 93(3), 729–747.
- ABREU, D., AND F. GUL (2000): "Bargaining and Reputation," Econometrica, 68(1), 85–117.
- ATHEY, S., K. BAGWELL, AND C. SANCHIRICO (2004): "Collusion and price rigidity," Review of Economic Studies, 71(2), 317–349.
- AUSUBEL, L., P. CRAMTON, M. PYCIA, M. ROSTEK, AND M. WERETKA (2014): "Demand Reduction and Inefficiency in Multi-unit Auctions," The Review of Economic Studies, 81(4), 1366–1400.
- AUSUBEL, L. M., AND P. MILGROM (2006): "The Lovely but Lonely Vickrey Auction," Combinatorial Auctions.
- AZEVEDO, E., AND J. LESHNO (2016): "A Supply and Demand Framework for Two-Sided Matching Mar- kets," Journal of Political Economy, 124(5), 1235–1268.
- BARON, D. P., AND R. B. MYERSON (1982): "Regulating a Monopolist with Private Information," Econometrica, 50(4), 911–930.

- BERGEMANN, D., B. BROOKS, AND S. MORRIS (2017): "First-Price Auctions with General Information Structures: Implications for Bidding and Revenue," Econometrica, 85(1), 107–143.
- BOARD, S., AND M. PYCIA (2014): "Outside Options and the Failure of the Coase Conjecture," The American Economic Review, 104(2), 656–671.
- BOARD, S., AND A. SKRZYPACZ (2016): "Revenue Management with Forward-Looking Buyers," Journal of Political Economy, 124(4), 1046–1087.
- BULOW, J., AND P. KLEMPERER (1994): "Auctions Versus Negotiations," American Economic Review. (1999): "The Generalized War of Attrition," American Economic Review, 89(1), 175–189.
- BULOW, J.AND ROBERTS, J. (1989): "The Simple Economics of Optimal Auctions," The Journal of Political Economy, pp. 1060–1090.
- CARROLL, G., AND I. SEGAL (2018): "Robustly optimal auctions with unknown resale opportunities," Review of Economic Studies.
- CRAMTON, P. (2013): "Spectrum Auction Design," Review of Industrial Organization, 42(2), 161–190.
- CREMER, J., AND R. P. MCLEAN (1988): "Full Extraction of the Surplus in Bayesian and Dominant Strategy Auctions," Econometrica, 56(6), 1247–1257.
- DEB, R., AND M. PAI (2017): "Discrimination via Symmetric Auctions," American Economic Journal: Microeconomics, 9(1), 275–314.
- DEMARZO, P. M., I. KREMER, AND A. SKRZYPACZ (2005): "Bidding with Securities: Auctions and Security Design," American Economic Review, 95(4), 936–959.
- DOVAL, L., AND V. SKRETA (2018): "Mechanism Design with Limited Commitment," arXiv preprint arXiv: 1811.03579.
- DWORCZAK, P., S. KOMINERS, AND M. AKBARPOUR (2021): "Redistribution Through Markets," Econometrica, 89(4), 1665–1698.
- EDELMAN, B., M. OSTROVSKY, AND M. SCHWARZ (2007): "Internet Advertising and the Generalized
- Second-Price Auction: Selling Billions of Dollars Worth of Keywords," American Economic Review, 97(1), 242–259.
- FUCHS, W., AND A. SKRZYPACZ (2010): "Bargaining with Arrival of New Traders," The American Economic Review, 100(3), 802–836.
- FUDENBERG, D., AND J. TIROLE (1983): "Sequential Bargaining with Incomplete Information," Review of Economic Studies, 50(2), 221–247.
- GALE, D., AND L. SHAPLEY (1962): "College Admissions and the Stability of Marriage," The American Mathematical Monthly, 69(1), 9–15.
- GARRETT, D. (2016): "Intertemporal Price Discrimination: Dynamic Arrivals and Changing Values," The American Economic Review, 106(11), 3275–3299.
- HAFALIR, I., M. YENMEZ, AND M. YILDIRIM (2013): "Effective Affirmative Action in School Choice," Theoretical Economics, 8(2), 325–363.
- HARTLINE, J. (2012): "Approximation in Mechanism Design," American Economic Review, 102(3), 330–36.
- HO¨RNER, J., AND L. SAMUELSON (2011): "Managing Strategic Buyers," Journal of Political Economy, 119(3), 379–425.
- JEHIEL, P., B. MOLDOVANU, AND E. STACCHETTI (1996): "How (Not) To Sell Nuclear Weapons," The American Economic Review, pp. 814–829.
- LIU, Q., K. MIERENDORFF, X. SHI, AND W. ZHONG (2019): "Auctions with Limited Commitment," American Economic Review, 109(3), 876–910.
- MILGROM, P. (2004): Putting Auction Theory to Work. Cambridge University Press.
- MILGROM, P., AND I. SEGAL (2019): "Clock Auctions and Radio Spectrum Reallocation," Journal of Political Economy.
- MILGROM, P., AND R. WEBER (1982): "A Theory of Auctions and Competitive Bidding," Econometrica, pp. 1089–1122.
- MYERSON, R. B. (1981): "Optimal Auction Design," Mathematics of Operation Research, 6(1), 58–73.

- MYERSON, R. B., AND M. A. SATTERTHWAITE (1983): “Efficient Mechanisms for Bilateral Trading,” Journal of Economic Theory, 29(2), 265–281.
- PAVAN, A., I. SEGAL, AND J. TOIKKA (2014): “Dynamic Mechanism Design: A Myersonian Approach,” Econometrica, 82(2), 601–653.
- ROTH, A., AND M. SOTOMAYOR (1990): Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis. Cambridge Univ, Press.
- SKRETA, V. (2015): “Optimal Auction Design under Non-Commitment,” Journal of Economic Theory, 159, 854–890.
- STOKEY, N. (1979): “Intertemporal Price Discrimination,” The Quarterly Journal of Economics, pp. 355– 371.
- YILDIZ, M. (2003): “Bargaining without a common prioran immediate agreement theorem,” Econometrica, 71(3), 793–811.
- ZHOUCHENG, C. (2002): “Optimal Auction with Resale,” Econometrica, 70(6), 2197–2224.

Vigencia desde:	Primavera 2025
Elaborado por:	Juan Escobar