ECO3901: Industrial Organization II

University of Toronto
Department of Economics

Winter 2026

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Office Hours: By appointment
Class Time: Tuesdays, 13:00–15:00

Course Overview

This course is the second part of the PhD Industrial Organization sequence. While the Fall term focused on the fundamentals of demand and production, this course bridges the gap between the basic static frameworks and the current frontiers in more advanced topics, including competitive conduct, vertical relations, single-agent dynamics, and dynamic-oligopoly games.

The semester is organized into three distinct modules:

1. **The Frontiers of Static Analysis:** We start by refreshing our memory on the static demand-and-supply models. We refine the computational implementation of the differentiated-product demand model (Week 1). We then master the frontier topics and methods in studying firms' competitive conduct (Week 2), endogenous product choice (Week 3), and vertical relations (Weeks 4 & 5).

2. **Single-Agent Dynamics:** We introduce the models and methods to study forward-looking decision making. We start with the numerical solution and estimation of a dynamic-optimization model (Weeks 6 & 7), followed by an introduction to industry dynamics without strategic interactions (Week 8).

3. **Dynamic Games:** We analyze strategic interactions over time. We learn estimation methods for dynamic oligopoly games (Week 9). We then study innovation and mergers (Week 10), and collusion (Weeks 11 & 12), from the perspectives of such models.

Course Requirements

- **Class Participation (Cold Calling):** Students are expected to read the assigned papers deeply. The class will rely on active discussion and cold calling rather than passive listening.
- **Problem Sets:** There are five computational problem sets designed to move you from a consumer of models to an architect of them.
  - **HW1:** Demand estimation & simulations with PyBLP.
  - **HW2:** Vertical relations.
  - **HW3:** Single-agent dynamics.
  - **HW4:** Dynamic-oligopoly games.
  - **HW5:** Collusion in repeated games.

Course Schedule

Module I: The Frontiers of Static Analysis (Weeks 1–5)

Week 1: Advanced Demand Estimation & Computational Best Practices

- **Reading 1:** Conlon, C., & Gortmaker, J. (2020). "Best Practices for Differentiated Products Demand Estimation with PyBLP." *RAND Journal of Economics*.
- **Reading 2:** Conlon, C., & Gortmaker, J. (2025). "Incorporating Micro Data into Differentiated Products Demand Estimation." *Journal of Econometrics*.
- *Assignment:* **HW1 Issued.**

Week 2: Testing Conduct & Market Power

- **Reading 1:** Backus, M., Conlon, C., & Sinkinson, M. (2021). "Common Ownership and Competition in the Ready-To-Eat Cereal Industry." Working paper.
- **Reading 2:** Miller, N., & Weinberg, M. (2017). "Understanding the Price Effects of the Miller–Coors Joint Venture." *Econometrica*.

Week 3: Endogenous Product Choice

- **Reading 1:** Fan, Y. (2013). "Ownership Consolidation and Product Characteristics: Daily Newspapers." *American Economic Review*.
- **Reading 2:** Eizenberg, A. (2014). "Upstream Innovation and Product Variety in the US Home PC Market." *Review of Economic Studies*.

Week 4: Vertical Relations I (Bargaining)

- **Reading 1:** Ho, K., & Lee, R. (2017). "Insurer Competition in Health Care Markets." *Econometrica*.
- **Reading 2:** Lee, R., Whinston, M., & Yurukoglu, A. (2021). "Structural Empirical Analysis of Contracting in Vertical Markets." *Handbook of Industrial Organization*.
- *Assignment:* **HW2 Issued.**

Week 5: Vertical Relations II (Vertical Integration)

- **Reading 1:** Crawford, G., Lee, R., Whinston, M., & Yurukoglu, A. (2018). "The Welfare Effects of Vertical Integration in Multichannel Television Markets." *Econometrica*.
- **Reading 2:** Lee, R., Whinston, M., & Yurukoglu, A. (2021). "Structural Empirical Analysis of Contracting in Vertical Markets."

Module II: Single-Agent Dynamics (Weeks 6–8)

Week 6: The Canonical Single-Agent Model and Estimation Method

- **Reading:** Rust, J. (1987). "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher." *Econometrica*.
- *Assignment:* **HW3 Issued.**

Week 7: Two-Step Estimation with Conditional Choice Probabilities (CCP)

- **Reading:** Hotz, V. J., & Miller, R. A. (1993). "Conditional Choice Probabilities and the Estimation of Dynamic Models." *Review of Economic Studies*.

Week 8: Industry Dynamics without Strategic Interactions

- **Reading:** Kalouptsidi, M. (2014). "Time to Build and Fluctuations in Bulk Shipping." *American Economic Review*.

Module III: Dynamic Games (Weeks 9–12)

Week 9: Two-Step Estimation of Dynamic Games

- **Reading:** Bajari, P., Benkard, C. L., & Levin, J. (2007). "Estimating Dynamic Models of Imperfect Competition." *Econometrica*.
- *Assignment:* **HW4 Issued.**

Week 10: Full-Solution Approach with Application to Innovation & Mergers

- **Reading 1:** Igami, M. (2017). "Estimating the Innovator's Dilemma: Structural Analysis of Creative Destruction in the Hard Disk Drive Industry, 1981–1998." *Journal of Political Economy*.
- **Reading 2:** Igami, M., & Uetake, K. (2020). "Mergers, Innovation, and Entry-Exit Dynamics: Consolidation of the Hard Disk Drive Industry, 1996–2016."*Review of Economic Studies*.

Week 11: Repeated Games and Collusion

- **Reading:** Igami, M., & Sugaya, T. (2022). "Measuring the Incentive to Collude: The Vitamin Cartels, 1990–1999." *Review of Economic Studies*.
- *Assignment:* **HW5 Issued.**

Week 12: Algorithmic Collusion

- **Reading 1:** Calvano, E., Calzolari, G., Denicolò, V., & Pastorello, S. (2020). "Artificial Intelligence, Algorithmic Pricing, and Collusion." *American Economic Review*.
- **Reading 2:** Calder-Wang, S., & G.H. Kim (2024). "Algorithmic Pricing in Multifamily Rentals: Efficiency Gains or Price Coordination?" Working paper.