Summary. This course focuses on the economic principles of pricing. The purpose of this course is two-fold. First, we will learn how to think rigorously about the use of market power and how to leverage that power through prices. Second, we will learn how to think about pricing strategy beyond merely posting a price. On the latter point, we will study (i) how pricing interacts with other aspects of strategy, (ii) the barriers to implementing particular pricing strategies, and how these barriers might be tackled; and (iii) how to price through different selling mechanisms, such as auctions. We do this through a mixture of lecture, case discussion, and modeling/analysis. The course is particularly appropriate for anyone who will have significant input to, or decision power in, the pricing process. The first portion of the course is case-intensive; the latter part of the course is more balanced between lectures and case discussions.

Notable topics include 1) the design of pricing schemes that segment the market, such as product bundling, and nonlinear pricing; 2) vertical pricing problems (transfer pricing, pricing and distribution); 3) legal constraints on pricing; and 4) the use of auctions as a pricing strategy, with a special focus on online ad auctions.

There are several homework assignments and a final exam. The assignments are roughly weekly, both individual and group-based, and involve significant use of Excel. Students will learn to use Solver and simulation tools in Excel.

Topics

There are three basic ways in which prices are set.

1. Negotiation: The oldest form of price setting, still going strong (even on the internet).
2. Posted Price: The seller announces a price and waits for buyers who are willing to transact at that price.
3. Auctions: The seller has buyers compete amongst themselves to determine the price at which a transaction will be executed.
In this course we focus on the latter two methods (though negotiation is often mentioned tangentially).

The following are examples of the kinds of questions we will learn how to think through:

- How can you apply basic economic reasoning to price new products for which detailed marketing data is not yet available?
- You’ve developed a new drug that requires variable doses. Should you sell it by the vial or by the patient?
- When and how should you sell by auction, rather than other methods?
- eBay provides you (the seller) ‘Buy-it-Now’ and ‘Best Offer’ buttons. Should you use them? Why should eBay provide these?
- How does competition impact how (and whether) you should bundle products?
- When does it make sense to attempt price discrimination? When do such strategies tend to backfire?
- How should you sell a limited supply of non-durable product when demand is uncertain? (Think: hotel rooms, airline tickets.)
- What strategies can a procurer use to intensify price competition among suppliers? What counter-strategies can suppliers use?
- An onerous bill on short term rentals has failed. Should AirBnB change its fees to hosts in response?

A note on course overlap. Given how central issues of pricing are, it is not surprising that there is some overlap with other elective courses at Kellogg: Besides building on core courses (MECN 430 and Strategy 430), the course has (some) overlap with MECN 441, and (much less) overlap with MKTG 462. In designing a course, the tradeoff is between (i) allowing some overlap, at the cost of some redundancy, and (ii) omitting some key topics, yielding an incoherent course. Choice (ii) also neglects those students who did not take those other courses. For these reasons, I prefer to overlap when necessary. However, even when topics overlap with other courses, the intention is to offer new or different insights than what you see in those other courses. In addition, a majority of past students’ evaluations state that the overlap is helpful.
Details

Required readings for the course consist of cases and occasional articles. I also recommend two pricing textbooks as optional additional references: *Principles of Pricing* by Krishnamurthi and Vohra and *The Strategy and Tactics of Pricing* by Nagle and Müller.\(^1\) This course’s emphasis is much closer to the former than the latter. I recommend the Krishnamurthi and Vohra book for a concise reference on the analytical concepts that we will cover in lecture. There are some points of overlap between our course and the Nagle book, but mainly I recommend it as side-reading. That book goes deeper into the marketing dimension of pricing than our course does.

The course grade will be based on homework assignments (40%), class participation (10%), and a timed final exam (50%). Some homeworks are to be done individually, while others are to be done in groups. Details will be announced at the beginning of the quarter. For group homeworks, at the beginning of the quarter I will randomly assign students to groups of three or four. You should work on these assignments as a team and turn in only one write-up for the group. Your grade on group homeworks will depend both on the write-ups and on a (strictly confidential) peer assessment handed in at the end of the quarter. Assignments must be submitted through Canvas by 1 PM on the due date. *I will not accept late assignments.* Note: there is an initial assignment (survey) due before the first day of class.

I can be contacted at isaias.chaves@kellogg.northwestern.edu, and my office is KGH 4181. Office hours will be held at a regular time every week (to be determined). The TA for Spring 2020 is TBD.

**Support for Accommodations** Students requesting accommodations related to a disability or other condition must register with AccessibleNU (accessiblenu@northwestern.edu; 847-476-5530) and provide me an accommodation notification from AccessibleNU. To the extent possible, please do this within the first two weeks of class. I will keep all such requests confidential.

\(^1\)Also acceptable are older editions of the book by Nagle and other coauthors.
Class Norms

For the purpose of maintaining a thriving and collaborative class dynamic, I ask for your help in maintaining the following norms for the course. I will help enforce these norms, but your effort to abide by them will not only benefit your learning, but also that of your classmates.

**Attendance**  You are required to attend class and be on time. I will take attendance every class. Your participation score will drop if you miss or are late for more than two classes. Per Kellogg policy, I will make exceptions for religious holidays, funeral attendance, and hospitalizations or severe illness of students and dependents. Interviews, traveling mishaps, weddings, and so on will count as absences—this is what the two “free” passes are meant to cover.

**Seating**  You will have assigned seats starting in the second week of the quarter. Please make sure to bring your nameplate to class and display it throughout the term.

**Electronic Devices**  Aside from essential medical devices, *no electronic devices (phones, tablets, laptops) may be used in class.* There is one exception: on certain class days, which I will announce in advance, we will do analytical exercises and simulations together that require you to use your laptop. During those exercises, please refrain from using your laptop for any other purpose (browsing, emailing, blogging, note-taking, etc). Anything that can produce a notification (ringers, speakers) should be switched off before the beginning of class.

**Class Participation**  Your class participation grade will depend both on your attendance and the quality of your contribution to the discussion. I am looking for comments and questions that (i) are relevant and move the discussion forward, (ii) are supported by evidence from the readings or your own experience, (iii) show your engagement with the concepts in the course, and (iv) ideally are original and thought-provoking. Please listen carefully to your classmates; *I especially value class participation that builds on the ideas and questions from your classmates.*
I will cold call regularly. If you feel that you are preparing well for class discussion, but I am not calling on you, please let me know.

On case days, I will randomly pick one of you to start off the discussion. If I call on you to lead the discussion, and you are not prepared, this will negatively impact your participation grade.

**Kellogg Honor Code**  The Kellogg Honor Code applies. The complete text is available at [http://www.kellogg.northwestern.edu/policies/honor-code.aspx](http://www.kellogg.northwestern.edu/policies/honor-code.aspx). In particular, you may not consult material containing solutions to the homework, including material prepared by current or former students of the course. You may not discuss group assignments with students outside of your group, and you may not discuss individual assignments with anyone other than the instructor.

**Outline (Subject to Change)**

Below is a class by class breakdown of what I intend to cover, as well as due dates for assignments. However, *I reserve the right to make changes so as to adapt to the pace of the class*. Such changes would be announced in class and/or via e-mail.

**Session 1: Why Pricing & Essential Frameworks**
- Margin vs Volume.
- Rational Buyer model, customer heterogeneity and demand curves.
- **Homework #0 due.**

**Session 2: Measuring Price Sensitivity**
- Relevant aspects of regression.
- Discuss conjoint, logit analysis.

**Readings**
Reference

Session 3: Demand Elasticity, Margin Rule
- Review monopoly pricing basics.
- Applying the margin rule.
- **Homework #1 due.**

Reference

Session 4: Biopure Case Discussion
- Connecting reference-based pricing to the price-sensitivity framework.
- Using models of behavior to construct underlying demand curves from fragmentary market data.

Reading
- Biopure HBS Case (Casepacket).

Session 5: Medicines Co. Case Discussion
- From Value-Based Pricing to Demand Curves.
- Implementation challenges.

Reading
- Medicines Co. HBS Case (Casepacket).

Reference
- Nagle and Müller, Chapter 5.

Session 6: Colonial Homes Case Discussion
- Introduction to vertical relations, industrial organization issues.
- **Homework #2 due.**
Reading
• Colonial Homes HBS Case (Casepacket).

Session 7: Pricing and Industrial Organization
• Agency vs Wholesale-Retail, Double Marginalization, Two-Part Tariffs.
• eBooks caselet.

Reading
• eBooks caselet (Canvas).

Session 8: Price Discrimination
• Versioning.
• Nonlinear pricing.

Reference
• Krishnamurthi and Vohra, Principles of Pricing, Chapter 6.

Session 9: Guest Lecture
• Erkan Bozkurt (Director of Data Strategy and Operations at Abbvie, former VP for Pricing Strategy & Revenue Management at Conagra) will share his experience with pricing analytics and strategy in the packaged goods industry.
• Homework #3 due.

Session 10: Price Discrimination (Continued)
• Bundling.
• Durable goods & commitment problems, promotions.

Readings
• JC Penney caselet (Canvas).
Session 11: Selling by Auction

- Common vs private value.
- Buyer incentives, auction format comparisons.

Reference

Session 12: Selling by Auction (Continued)

- Auction design.
- Introduction to multi-unit auctions.

Session 13: Online Ad Auctions

- Finish auction formats: role of reserve prices.
- Yahoo! Market-Based Reserve Pricing Caselet.

References/Readings
- Read Section 3.1 of Ostrovsky and Schwarz (2016) “Reserve Prices in Internet Advertising Auctions: A Field Experiment” (Canvas).

References
- [http://thefirstbannerad.com/links.html](http://thefirstbannerad.com/links.html) for the first banner ad.
- “‘The beginning of a giant industry’: An oral history of the first banner ad” at [https://digiday.com/media/history-of-the-banner-ad/](https://digiday.com/media/history-of-the-banner-ad/).

Session 14: Pricing for Two-Sided Platforms

- Network effects.
- “Seesaw” principle.
- **Homework #4 due.**
Session 15: Revenue Management I

- How to handle dynamic demand under capacity constraints?

Reference

Session 16: Yield Management II, Intro to Pricing and Competition

- Finish revenue management, TNG case discussion.
- Pricing and Competition: basic framework, capacity issues.
- Homework #5 due.

Reading
- TNG HBS Case (Casepacket).

Reference

Session 17: Pricing and Competition II

- Pricing and competition: differentiation.

Session 18: UK Credit Card Case Discussion

- Timing issues & adverse selection.
- Homework #6 due.

Reading
- UK Credit Cards HBS Case (A) (Casepacket). Case (D) handed out in class.

Session 19: Bitter Competition Case Discussion

- Entry preemption, inferior entry.
Reading
- Bitter Competition HBS Case (A) (Casepacket).

Session 20: Bitter Competition (Continued)
- Signaling, anti-trust issues.
- **Homework #7 due.**

Readings
- Bitter Competition HBS Case (D) (Casepacket). Case (E) handed out in class.

**Final Exam:** timed exam, self-scheduled.