

**26:711:685****Special Topics on Management Science---Dynamic Pricing and Revenue Management**

Fall 2018; Wednesday 10am~12:50pm, 1WP-358

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Office Hours: Monday and Wednesday 2:30~3:30pm

**COURSE DESCRIPTION**

This course provides students a basic understanding on the modern theory and practice of dynamic pricing and revenue management. It covers topics such as market-response models, economics of revenue management, estimation and forecasting, single-resource capacity control, network capacity control, overbooking, dynamic pricing of reversible and irreversible varieties, auction, competitive pricing, joint inventory-price control, and control with ambiguity.

**COURSE MATERIALS (texts to be referenced)**

Talluri, K.T. and G.J. van Ryzin. 2004. *The Theory and Practice of Revenue Management*. Kluwer Academic Publishers.

Various academic articles on capacity allocation and price control.

**LEARNING GOALS AND OBJECTIVES**

The course is based on both a textbook and many research articles. Students are expected to become familiar with topics related to dynamic pricing such as capacity planning, price control, competition, and joint control, as well as tools used in the analysis ranging from dynamic programming to linear programming. They will also be given opportunities to hone their skills in literature search, topic identification, formulation, problem solving, writing, and presentation.

**PREQUISITES**

Prior knowledge in mathematical programming and stochastic processes is recommended.

**ACADEMIC INTEGRITY**

*I do NOT tolerate cheating.* Students are responsible for understanding the RU Academic Integrity Policy ([https://slwordpress.rutgers.edu/academicintegrity/wp-content/uploads/sites/41/2014/11/AI\\_Policy\\_2013.pdf](https://slwordpress.rutgers.edu/academicintegrity/wp-content/uploads/sites/41/2014/11/AI_Policy_2013.pdf))

I will strongly enforce this Policy and pursue *all* violations. On all examinations and assignments, students must sign the RU Honor Pledge, which states, "On my honor, I have neither received nor given

any unauthorized assistance on this examination or assignment.” Don’t let cheating destroy your hard-earned opportunity to learn. See [business.rutgers.edu/ai](https://business.rutgers.edu/ai) for more details.

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## **ATTENDANCE AND PREPARATION POLICY**

Expect me to attend all class sessions. I expect the same of you. If I am to be absent, my department chair or I will send you notice via email and Blackboard as far in advance as possible. If you are to be absent, report your absence in advance at <https://sims.rutgers.edu/ssra/>. If your absence is due to religious observance, a Rutgers-approved activity, illness, or family emergency/death and you seek makeup work, also send me an email with full details and supporting documentation one week ahead of the occurrence.

For weather emergencies, consult the campus home page. If the campus is open, class will be held. Expect me to arrive on time for each class session. I expect the same of you. Expect me to remain for the entirety of each class session. I expect the same of you. Expect me to prepare properly for each class session. I expect the same of you. Complete all background reading and assignments. You cannot learn if you are not prepared. Expect me to participate fully in each class session. I expect the same of you. Stay focused and involved. You cannot learn if you are not paying attention.

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## **CLASSROOM CONDUCT**

Cell phones or any other course-unrelated electronic devices are banned from class.

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## **EXAM POLICIES**

There is one final exam. During the exam, the following rules apply:

- You are allowed a one-page cram sheet (letter size, front and back) of your own handwriting.
  - If you have a disability that influences testing procedures, provide me an official letter from the Office of Disability Services at the start of the semester.
  - No cell phones or other electronics are allowed in the testing room.
  - Alternate seating; do not sit next to another student or in your usual seat.
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## **GRADING POLICY**

- One academic paper (review or new topic) on a relevant subject (capacity, pricing, joint, competition, etc.) at 50 points
- One presentation at 30 points
- Other class participation at 20 points; attendance, paper discussion, etc.

The proposed letter grade assignment is as follows:

<b>F</b>	0—29.999
<b>D</b>	30—49.999
<b>C</b>	50—64.999
<b>C+</b>	65—69.999

<b>B</b>	70—84.999
<b>B<sup>+</sup></b>	85—89.999
<b>A</b>	90—100

Late assignments will be penalized 20 points (on the 100 point scale) if turned in up to ONE week late. Assignments in excess of ONE week late will not be accepted. There will be no makeup exam, nor extra credit. Your final grade is not subject to negotiation.

### **COURSE SCHEDULE (Tentative Course Progress)**

<b>Date</b>	<b>Coverage</b>
September 5	1: Demand Management and Market Responses Bitran and Caldentey (2003)
September 12	2: Customer-behavior and Market-response Models
September 19	3: Economics of Revenue Management
September 26	4: Single-resource Capacity Control Belobaba (1989); Lee and Hersh (1993); Brumelle and McGill (1993)
October 3	5: Network Capacity Control Talluri and van Ryzin (1998)
October 10	6: Approximations and Solution Methods Cooper (2002); Adelman (2007); Kunnumkal and Topaloglu (2010)
October 17	7: Pure Dynamic Pricing Gallego and van Ryzin (1994); Zhao and Zheng (2000)
October 24	8: Dynamic Pricing involving Competition Yang and Xia (2013); Gallego and Hu (2014)
October 31	9: An Overview of Auctions
November 7	10: Optimal Auctions and Revenue Equivalence Riley and Samuelson (1981)
November 14	11: More on Auctions Myerson (1981); Milgrom and Weber (1982)
November 21	No class—Friday schedule due to Thanksgiving
November 28	12: Joint Inventory-price Control Federgruen and Heching (1999); Chen and Simchi-Levi (2004)
December 5	13: Inventory-price Control involving Ambiguity

	Besbes and Zeevi (2009); Chen, Chao, and Ahn (2015); Katehakis, Yang, and Zhou (2018)
December 12	Class Presentation
December 19	Class Presentation

## SUPPORT SERVICES

If you need accommodation for a *disability*, obtain a Letter of Accommodation from the Office of Disability Services. The Office of Disability Services at Rutgers, The State University of New Jersey, provides student-centered and student-inclusive programming in compliance with the Americans with Disabilities Act of 1990, the Americans with Disabilities Act Amendments of 2008, Section 504 of the Rehabilitation Act of 1973, Section 508 of the Rehabilitation Act of 1998, and the New Jersey Law against Discrimination. <https://ods.rutgers.edu>

If you are a military *veteran* or are on active military duty, you can obtain support through the Office of Veteran and Military Programs and Services. <http://veterans.rutgers.edu/>

If you are in need of *mental health* services, please use our readily available services.  
 Rutgers University-Newark Counseling Center: <http://counseling.newark.rutgers.edu/>  
 [Rutgers Counseling and Psychological Services – New Brunswick: <http://rhscaps.rutgers.edu/>]

If you are in need of *physical health* services, please use our readily available services.  
 Rutgers Health Services – Newark: <http://health.newark.rutgers.edu/>  
 [Rutgers Health Services – New Brunswick: <http://health.rutgers.edu/>]

If you are in need of *legal* services, please use our readily available services: <http://rusls.rutgers.edu/>

If you are in need of additional *academic assistance*, please use our readily available services.  
 Rutgers University-Newark Learning Center: <http://www.ncas.rutgers.edu/rlc>  
 Rutgers University-Newark Writing Center: <http://www.ncas.rutgers.edu/writingcenter>  
 [Rutgers University-New Brunswick Learning Center: <https://rlc.rutgers.edu/>]