**TOPIC:** This year, the class will be run as an advanced seminar on the topic of “Revenue Management meets Dynamic Mechanism Design”. The first few classes will be traditional lectures focused on classical game theory and mechanism design, while most of the semester will be run as a seminar covering recent papers.

Both the revenue management (RM) and the economics community have long been interested in the question of how to optimally sell products to consumers. Traditionally, RM researchers and economists have relied on different toolkits and addressed different problems. RM researchers typically used OR/MS tools to solve problems centered on dynamics and economists relied on mechanism design to focus on incentive problems.

Over the last few years, two developments have blurred the lines between the problems addressed by these two communities. The first development is theoretical: recent advances in dynamic mechanism design have made problems at the interface of the two communities tractable. The second development is the rise of online marketplaces, where both dynamics and incentive issues are first-order concerns. The goal of this course is to get students ready to do research in this exciting new interdisciplinary field of study.

**CONTENTS:**

**Part 1 – Game Theory and Mechanism Design**

Week 1 – Introduction to game theory, dominant strategies equilibrium, pure and mixed Nash equilibrium.

Week 2 – Subgame perfect equilibrium, Bayesian Nash equilibrium.

Week 3 – Perfect Bayesian equilibrium, introduction to auction theory.

Week 4 – Introduction to mechanism design, the revelation principle, efficient mechanisms.

**Part 2 - Revenue Management meets Dynamic Mechanism Design**

Week 5 – Optimal Mechanism Design

Week 6 – Efficient and Optimal Dynamic Mechanism Design


Week 7 – Dynamic Mechanism Design Applied to Classical RM – Part I

- Board and Skrzypacz, “Revenue Management with Forward-Looking Buyers,” forthcoming in JPE.
- Gershkov, Moldovanu and Strack, “Revenue Maximizing Mechanisms with Strategic Customers and Unknown Demand: Name-Your-Own-Price”, Berkeley working paper.

Week 8 – Dynamic Mechanism Design Applied to Classical RM – Part II

- Chen and Farias, “Robust Dynamic Pricing With Strategic Customers,” MIT working paper.
- Akan, Ata and Dana, “Revenue Management by Sequential Screening,” JET ’15.

Week 9 – The Deadlines Approach


Week 10 – Commitment Issues


Week 11 – Cookies


Week 12 – A New Application of RM: Online Markets

Week 13 – Empirical Work

- Moon, Bimpikis and Mendelson, “Randomized Markdowns and Online Monitoring,” Stanford working paper.

TEXTBOOK

Fort Part 1 of the course, any graduate-level game theory textbook should work. The textbook “Game Theory” by Fudenberg and Tirole is recommended, but not required. For Part 2 of the course, we will rely on papers rather than a textbook.

ASSIGNMENTS

There will be two homework assignments early in the semester that will cover the basic material (Part 1 of the course). Late assignments will not be accepted unless due to documented serious illness or family emergency. The professor will make exceptions for religious observance or civic obligation only when the assignment cannot reasonably be completed prior to the due date and the student makes arrangements for late submission with the professor in advance. The assignments must be prepared individually in order to receive credit.

CLASS PARTICIPATION

The professor will judge class participation on the extent to which you appear prepared, the relevance and depth of your comments, the degree to which you listen carefully and respond to your peers, and your willingness to take chances in order to further the educational experiences of others. Please notify your instructor by email two days in advance if you have to be late or leave early from class.

PAPER REVIEWS

For Part 2 of the course, students are required to submit short paper reviews of the papers that we will cover. These must be submitted two days (by Tuesday, at 2pm) before the lecture in which the paper is presented. They must evaluate the strengths and weaknesses of each paper. I recommend students to try to be constructive in their reviews.

PRESENTATIONS

Students will have to present papers in class. They are highly encouraged to schedule an appointment with the instructor a week before a scheduled presentation where they explain how they plan to cover the assigned paper.

GRADING

At NYU Stern we seek to teach challenging courses that allow students to demonstrate differential mastery of the subject matter. Assigning grades that reward excellence and reflect differences in performance is important to ensuring the integrity of our curriculum. The
distribution of grades for this course will depend solely on the performance of the students in the course.

The components of the grade are: 25% for the homework assignments, 25% for the paper reviews, 50% for their presentations.

**RE-GRADING**

In line with Grading Guidelines for NYU Stern, the process of assigning of grades is intended be one of unbiased evaluation. This means that students are encouraged to respect the integrity and authority of the professor’s grading system and discouraged from pursuing arbitrary challenges to it. If a student feels that an inadvertent error has been made in the grading of an individual assignment or in assessing an overall course grade, a request to have that the grade be re-evaluated may be submitted. Students should submit such requests in writing to the professor within 7 days of receiving the grade, including a brief written statement of why he or she believes that an error in grading has been made.

**WEBSITE/COURSE MATERIALS**

NYU Classes will be used as the main communication media, and materials will be posted in the system. This includes the lecture notes, the homework assignments, the in-class cases, and etc. To log in, you will need your Stern email account and the associated password.

**CLASSROOM NORMS**

Cell phones, laptops and other electronic devices are a disturbance to both students and professors. All electronic devices must be turned off prior to the start of each class meeting.

**ACADEMIC INTEGRITY**

Integrity is critical to the learning process and to all that we do here at NYU Stern. All students are expected to abide by the NYU Stern Student Code of Conduct. A student’s responsibilities include, but are not limited to:

- A duty to acknowledge the work and efforts of others when submitting work as one’s own. Ideas, data, direct quotations, paraphrasing, creative expression, or any other incorporation of the work of others must be clearly referenced.
- A duty to exercise the utmost integrity when preparing for and completing examinations, including an obligation to report any observed violations.

Please see [www.stern.nyu.edu/uc/codeofconduct](http://www.stern.nyu.edu/uc/codeofconduct) for more information.

**STUDENTS WITH DISABILITIES**

Students whose class performance may be affected due to a disability should notify the instructor early in the semester so that arrangements can be made, in consultation with the Henry and Lucy Moses Center for Students with Disabilities, to accommodate their need.