

Industrial Organization 1: Foundations

B. Caillaud and J.P. Tropeano
APE Program M2: 2024-2025

Targeted audience

This course is a core course in industrial organization: it is typically chosen by students registered in the *Economic Theory or Regulation, Environment and Markets* research workgroups.

The topic of the course is to study markets in which perfect competition among firms is not an acceptable assumption. Considering imperfect competition models to analyze the supply side of many markets is critical in order to better describe how real-world markets function, what are their efficiency performances and how they can, or should, be disciplined or regulated.

In this perspective, anyone interested in the supply side of the economy should find fundamental and central material in this course. In particular, students interested in competition policy, in mergers and acquisitions, in innovation, in online platforms and the use of personal data, ... from a corporate point of view or from a public policy point of view, will find the course useful.

Although PSE / APE is not a business school, the course is also central for those who intend to work in the consulting sector: the various pricing and marketing strategies of firms, their strategic decisions and investments, are related to the structure of the markets in which they participate, and the course will also offer insights on firms' behavior when they try to gain or maintain market power.

Economists specialized in IO with both a solid theoretical knowledge and interest and a strong empirical background are highly valued on the academic job market. So, it makes perfect sense to build a curriculum that makes you familiar with advanced theoretical tools (IO, game theory and regulation / public intervention) and empirical methods (structural econometrics and data analysis, on top of the standard M1-APE econometrics curriculum).

The choice of topics and of approach

Industrial Organization is a vast domain of research that has been exploited heavily since the 70s. Many of the fundamental models used to analyze imperfect competition, differentiation, entry and strategic manipulation, mergers, vertical relationships, personalized pricing, R&D and patents, ... have been developed in the end of the XXth century. Even recent theoretical and empirical investigations on these themes rely on these fundamental "classical" models that most of the students do not know but should learn.

At the same time, fascinating new challenges have been raised for IO in the past 10-15 years and there are many new developments that echo current public debates and concerns: most of them are related to the rise of the online economy as e.g. new issues in targeted advertising, the economics of platforms, patent pools,

advanced price discrimination relying on data ... A stimulating approach to IO must necessarily spend time presenting these new issues in which research is active and promising.

The course will work on both frontlines! We will cover most of the standard theoretical models and explain their central theoretical contributions in the field, as these may be considered as reference points for any new developments in IO; and we will present a selection of recent and active topics, usually both from a theoretical and an empirical perspective. That said, it should be clear that we have a definite pro-theory bias and a definite bias towards the themes of our own research.

There are many other IO economists at PSE and our aim is to provide a comprehensive view of the field at PSE. So, first, we will try to invite one or two other PSE professors to deliver parts of the course on which they are strong research contributors: in the past, we invited P. Gagnepain on the empirical evaluation of mergers or of entry and Catherine Bobtcheff on the dynamics of R&D investments.

Our course enters a general sequence in *Industrial Organization* over the whole master program. The course *Industrial Organization 2: Applications to competition policy* that is proposed by David Spector as an elective of S2 (updated version of the previous elective course *IO and Applications to antitrust and regulation*) would then be the second part of the sequence in M2. Both courses have been designed in coordination and so as to be complementary, David's course providing a rich collection of applications of IO to competition policy issues, building and elaborating extensions on the fundamental models that we present. Both these M2 courses have been elaborated building on discussions with Philippe Gagnepain who teaches the elective course in M1: *Industrial Organization: a primer*. Philippe's course proposes a more empirical approach that does not require too much theoretical content, in contrast to the core course we propose. A quick survey among the students suggested that the articulation of these M1 and M2 courses is adequate and it has then been maintained.

Requirements, organization and evaluation

The course requires some knowledge in *Microeconomics* as well as in *Game Theory*. Attendance to the course of *Introduction to Industrial Organization* (P. Gagnepain, M1-S2) is not a prerequisite.

The course consists in 24 sessions of 1h30 each, over 12 weeks. J.P. Tropicano will deliver the first 12 sessions, and B. Caillaud will deliver the 12 other sessions. There are no tutorials associated to this course. A basic reading list will be provided that contains roughly 1 or 2 required readings per session and a few additional readings per session to go further. There will also be more elaborate reading lists depending on the subjects for those who want to go deeper.

The final grade is based on a final exam (50% of the final grade) and a paper presentation during the course (50% of the final grade).

The final exam will take place during the dedicated week in January. There will be two parts. First, exercises to be solved, using the standard tools used in the course, in some variation of frameworks seen in class. To help students practice and get familiar with the usual IO analysis, we provide a long list of exercises that have been given in the past as exams, homework assignments, or simply practice exercises. Second, questions on a paper that will be chosen among the papers of the “presentation-sessions” (details and preliminary list below). We will tell you the day before the exam which paper has been chosen and, on the exam day, we will give you a hard copy of the paper.

The paper presentation will take place during the lectures. A list of possible papers to be presented is provided in the lecture-by-lecture syllabus that follows. Students should form pairs and each pair of students should choose a paper to present, on a first-come-first-served basis, starting on September 25th at 7 pm (platform link sent by email in the coming days). Presentations can be prepared using any tool that students find useful, including AI. The presentation will be oral, without slides, handwriting on the board is accepted. It should last 40’ at most during which both students will speak for roughly the same duration.

References

Basic textbooks that will prove useful are:

- Tirole, J., 1988, *The Theory of Industrial Organization*, MIT Press.
- Belleflamme, P. and M. Peitz, 2010, *Industrial Organization: Markets and Strategies*, Cambridge University Press.

Schedule

J.-P. Tropéano's Part (6 weeks, 12 classes):

1. Entry
 - a. Production Capacity as a barrier to entry
 - b. The Fundenberg and Tirole typology
 - c. Presentation: "On Excessive Entry in Bayes-Cournot Oligopoly", RANDJE, 2025
2. Horizontal mergers
 - a. The theory of horizontal mergers
 - b. The empirics of horizontal mergers impact
 - c. Presentation: "Do Merger efficiencies always mitigate price increases?", JIE, 2018
3. Horizontal Collusion
 - a. Stylized facts on cartels
 - b. The theory of tacit collusion
 - c. Antitrust policy and cartels
 - d. Presentation: "Does enforcement deter cartels? A tale of two tails" IJIO, 2017
4. Vertical relations
 - a. Vertical contracts: pro and anticompetitive effects
 - b. Vertical contracts and entry
 - c. Presentation: "The demand-boost theory of exclusive dealing", RANDJE, 2020
 - d. Presentation: "Exclusive Dealing and Entry, when Buyers Compete", AER, 2006

B. Caillaud's Part (6 weeks. 12 classes):

This part consists in three themes. The first one relates to the lack of information on the consumers' side, their inability to figure out all the possible goods to be purchased and corresponding prices at no cost. These features are a source of market power for firms and give rise to manipulation strategies by firms. We will cover:

1. Limited consumers' information and search costs : simultaneous search, sequential search, search for a match, ordered search, obfuscation.
 - a. Presentation: "A model of Directed Consumer Search", IJIO 2018.
 - b. Presentation: "Influencing Search", RANDJE 2024
2. Advertising: advertising in oligopolies, targeted advertising, advertising and information disclosure.
 - a. Presentation: "Advertising as a Search Deterrent", RANDJE 2017.

The second theme deals with network effects and platforms. This theme is a central one in the analysis of the online economy. It has also strong links with the

previous theme as advertising is a central strategic instrument for platforms.

Topics addressed are:

3. Two-sided markets: network effects, monopolistic two-sided platforms, imperfect competition among two-sided platforms, issue of multi-homing
4. Applications to the media industry and online advertising
 - a. Presentation: “Platform Design Biases in Ad-funded two-sided Markets”, RANDJE 2023
5. Platform economics and competition policy: tie-in / bundling, mergers among platforms.
 - a. Presentation: “A Model of Mobile App and Ad Platform Markets”, IJIO 2024
6. Consumers personal data: ownership, market, and impact on the industry structure.

The third and last theme corresponds to the vast domain of innovation, R&D, and protection of intellectual property, viewed from the point of view of IO, i.e. how firms engage in innovation activities, why these activities are intimately related to market power and what are the consequences for market structure. Only a selection of topics will be discussed, such as e.g. :

7. Incentives to innovate and protection of IP
 - a. Presentation: “Product Development with Lurking Patentees”, RANDJ2 2025
8. Sequential innovations: patent or not patent?
9. Patent pools and standards