
MARKET, AUCTION AND CONTRACT DESIGN

IE University

Professor: **HANG DONG**

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Academic year: 23-24

Degree course: SECOND

Semester: 2^o

Category: COMPULSORY

Number of credits: 3.0

Language: English

PREREQUISITES

The students should be familiar with the basic concepts in the Game Theory.

SUBJECT DESCRIPTION

The questions we want to answer in this subject is that do the market rules serve the objectives given the market rules. If not, how we can improve them? The purpose of the course is to improve market efficiency through designing market mechanisms. The course incorporates two parts: auction and matching. In settings where prices are the key determinant, auction is helpful to assign and price scarce resources, such as search keyword and spectrum. In settings where there is no monetary motivation, matching is used to improve the allocation of scare resources, such as medical resource, school allocation.

OBJECTIVES AND SKILLS

One principal goal in this class is to introduce you to tools of mechanism design and its applications. The class focuses on the applications of the theoretical models. More specially, after this class, you should be able to 1. understand basic market design mechanism theories; 2. identify examples in the realistic world where market design is relevant; and 3. analyze optimal strategies for market stakeholders.

METHODOLOGY

The class is case-based and well-associated with the realistic examples. For each block of the class, we start with a lecture on theories, followed by a session on an application of the theories. The students would be required to read other cases using the same theories and present them.

Teaching methodology	Weighting	Estimated time a student should dedicate to prepare for and participate in
Lectures	20.0 %	15 hours
Discussions	13.33 %	10 hours
Exercises	20.0 %	15 hours
Group work	13.33 %	10 hours

Other individual studying	33.33 %	25 hours
TOTAL	100.0 %	75 hours

PROGRAM

SESSION 1 (LIVE IN-PERSON)

Topics:

Overview of the class, Market design intro

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 1) (See Bibliography)

Article: What Really Matters in Auction Design (Journal of Economic Perspectives—Volume 16, Number 1—Winter 2002—Pages 169–189) (CED)

SESSION 2 (LIVE IN-PERSON)

Topic:

Simple Auction 1 (Ascending Auctions and second-price auction)

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 2.1- 2.4) (See Bibliography)

SESSION 3 (LIVE IN-PERSON)

Topic:

Simple Auction 2 (Descending Auction and First-price auction)

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 2.6 -2.8) (See Bibliography)

SESSION 4 (LIVE IN-PERSON)

Topic:

Simple Auction Theory Application: An analysis of eBay

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 3) (See Bibliography)

SESSION 5 (LIVE IN-PERSON)

Topic:

The Vickrey-Clarke-Groves (VCG) Auction 1

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 4) (See Bibliography)

SESSION 6 (LIVE IN-PERSON)

Topic:

The Vickrey-Clarke-Groves (VCG) Auction 2

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 4) (See Bibliography)

SESSION 7 (LIVE IN-PERSON)

Topic:

Application of the VCG Auction: Keywords Auction

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 4) (See Bibliography)

SESSION 8 (LIVE IN-PERSON)

Presentation and Review on Auction

SESSION 9 (LIVE IN-PERSON)

Mid term exam

SESSION 10 (LIVE IN-PERSON)

Topic:

Matching Theory

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 9) (See Bibliography)

Article: College Admissions and the Stability of Marriage (The American Mathematical Monthly, Vol. 69, No. 1 (Jan., 1962), pp. 9-15 Published by: Mathematical Association of America) (CED)

SESSION 11 (LIVE IN-PERSON)

Topic:

The Medical Match

Reading Assignment:

Two short articles by Sara Robinson: "Are Medical Students Meeting Their (Best Possible) Match?" (Siam News, April 2003) and "Tweaking the Math to Make Happier Medical Marriages," (New York Times, August 24, 2004).

Book Chapters: Market design: auctions and matching (Ch. 10) (See Bibliography)

Article: Are Medical Students Meeting Their (Best Possible) Match? (SIAM News, Volume 36, Number 3, April 2003) (CED)

Article: Tweaking the Math to Make Happier Medical Marriages (The New York Times, August 24, 2004) (CED)

SESSION 12 (LIVE IN-PERSON)

Topic:

Assignment Problems 1

Reading Assignment:

Book Chapters: Market design: auctions and matching (Ch. 11) (See Bibliography)

SESSION 13 (LIVE IN-PERSON)

Topic:

Assignment Problems 2

Reading Assignment:

Short Article: "Kidney Exchange: A Life-Saving Application of Matching Theory," (Google "Kidney Exchange NSF").

Short article on American Mathematical Society website, "School Choice" by Joseph Malkevitch (Google: "School Choice AMS").

Book Chapters: Market design: auctions and matching (Ch. 11) (See Bibliography)

SESSION 14 (LIVE IN-PERSON)

Presentation and Review on Matching

SESSION 15 (LIVE IN-PERSON)

Final Exam

BIBLIOGRAPHY

Compulsory

- Guillaume Haeringer. (2018). *Market design: auctions and matching*. The MIT Press. ISBN 9780262037549 (Printed)

EVALUATION CRITERIA

Your final grade in the course will be based on both individual and group work of different characteristics that will be weighted in the following way:

Criteria	Percentage	Comments
Final Exam	45 %	
Group Presentation	15 %	
Class Participation	15 %	
Intermediate Tests	25 %	

Each student has four attempts over two consecutive academic years to pass this course. Students whose final average grade is below 5 do not pass the class. As well students whose final exam grade is below 5 will not pass the class (Unplugged and elective classes exempt from this rule). In these cases, students will be required to take the extraordinary retake exam. The retake exam will be scheduled in and the date/time is not subject to change. The exam should be comprehensive (cover the entire course), and the passing grade is 5/10 with a max grade of 8/10.

Students must attend at least 70% of the sessions. Students who do not comply with the 70% attendance rule will receive a 0.0 on their first and second attempts and go directly to the third one (they will need to enroll in this course again the following academic year).

Students who are in the third or fourth attempt should contact the professor during the first two weeks of the course.

ATTENDANCE

Attendance is mandatory at IE University, as it is an essential factor of IE's learning methodology. Each student may miss up to 30% of the sessions within a given course and still maintain the possibility of passing that given course. This 30% "buffer" is to be used for any absences, such as: illnesses, personal emergencies, commitments, official/governmental matters, business and/or medical appointments, family situations, etc. Students should manage their various needs, and situations that may arise, within that 30% buffer. If a student is absent to more than the allowed 30% of the sessions (regardless of the reason), s/he will obtain a 0.0 grade for that course in both the ordinary and extraordinary calls of the current academic year, and s/he will have to retake the course during the following academic year. Having established the rule, we strongly discourage to use this buffer as granted, we highly recommend to attend 100% of the classes as it will improve your learning outcomes, it will increase the class performance, and improve your participation grade. Extreme cases involving emergencies such as: extended hospitalizations, accidents, serious illnesses and other contexts involving force majeure, are to be consulted with the Program Management team for assessment of the situation and corresponding documentation, so that Program Management can support and guide each student optimally.

PLAGIARISM / ACADEMIC HONESTY

Plagiarism is the dishonest act of presenting another person's ideas, texts or words as your own. This includes in order of seriousness of the offense:

- providing faulty sources;
- copy-pasting material from your own past assignments (self-plagiarism) without the instructor's permission;
- copy-pasting material from external sources even while citing them;
- using verbatim translations from sources in other languages without citing them;
- copy-pasting material from external sources without citing them;
- and buying or commissioning essays from other parties.
- receiving excessive and/or unreported help from personal tutors.

IEU students must contact the professor if they don't know whether the use of a document constitutes plagiarism. The professor will advise the student on how to present said material. All written assignments have to be submitted through Turnitin, which produces a similarity report and detects cases of plagiarism. Professors are required to check each student's academic work in order to guarantee its originality. Students using external tutorial support should report it to the professor and the BIE Program from the moment they began receiving this support.

If the originality of the academic work is not clear, the professor will contact the student in order to clarify any doubts. In the event that the meeting with the student fails to clarify the originality of the academic work, the professor will inform the Director of the Bachelor Program about the case, who will then decide whether to bring the case forward to the BIE Academic Review Panel. Very high similarity scores will be automatically flagged and forwarded to the Academic Review Panel. Plagiarism constitutes a very serious offense and may carry penalties ranging from getting a zero for the assignment to expulsion from the university depending on the severity of the case and the number of times the student has committed plagiarism in the past.

PROFESSOR BIO

Professor: **HANG DONG**

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Hang Dong is assistant professor of Finance at the IE University. He holds PhD in Business Administration and Quantitative Methods from the University Carlos III of Madrid. Prior to his PhD study, Hang worked as a journalist and an editor at the Finance Channel at China Central Television Station. His research interests include behavioral finance and application of information systems in finance. In particular, he focuses on how social media affects investor behaviors in financial markets. His research has been published in academic journals such as International Review of Financial Analysis, Journal of Business Research, Journal of the Association for Information Science and Technology, Information & Management, and Journal of Accounting and Public Policy.

OTHER INFORMATION

Office Hour: TBA

Contact details: hdong@faculty.ie.edu

CODE OF CONDUCT IN CLASS

1. Be on time: Students arriving more than 5 minutes late will be marked as “Absent”. Only students that notify in advance in writing that they will be late for a specific session may be granted an exception (at the discretion of the professor).
2. If applicable, bring your name card and strictly follow the seating chart. It helps faculty members and fellow students learn your names.
3. If connecting remotely, leave video feed on at all times.
4. Do not leave the room during the lecture: Students are not allowed to leave the room during lectures. If a student leaves the room during lectures, he/she will not be allowed to re enter and, therefore, will be marked as “Absent”. Only students that notify that they have a special reason to leave the session early will be granted an exception (at the discretion of the professor).
5. Do not engage in side conversation. As a sign of respect toward the person presenting the lecture (the teacher as well as fellow students), side conversations are not allowed. If you have a question, raise your hand and ask it. If you do not want to ask it during the lecture, feel free to approach your teacher after class. If a student is disrupting the flow of the lecture, he/she will be asked to leave the classroom and, consequently, will be marked as “Absent”.
6. Use your laptop for course-related purposes only. The use of laptops during lectures must be authorized by the professor. The use of Social Media or accessing any type of content not related to the lecture is penalized. The student will be asked to leave the room and, consequently, will be marked as “Absent”.
7. No cellular phones: IE University implements a “Phone-free Classroom” policy and, therefore, the use of phones, tablets, etc. is forbidden inside the classroom. Failing to abide by this rule entails expulsion from the room and will be counted as one absence.
8. Escalation Policy: the first time you are asked to leave the classroom it will be counted as an absence. If it happens a second time, it will be counted as 3 absences, and an Academic Review Panel will be consulted to discuss other possible sanctions, up to an including possible failing of course and in extreme cases expulsion from program.