



## Course and Examination Fact Sheet: Autumn Semester 2023

### 5,246: Introduction to Market Design

ECTS credits: 3

#### Overview examination/s

(binding regulations see below)

decentral - Digital written examination, Digital, Individual work individual grade (100%, 90 Min.)

Examination time: Term time

#### Attached courses

Timetable -- Language -- Lecturer

[5,246,1.00 Introduction to Market Design](#) -- English -- [Häfner Samuel](#)

#### Course information

#### Course prerequisites

Familiarity with basic algebra and analysis is expected. Other than that, the course will be self-contained. In particular, no existing knowledge of game theory is required. Nevertheless, students should be willing to engage in formal arguments and some abstract mathematical modeling.

#### Learning objectives

The course gives an introduction to market design, which comprises auctions and matching markets.

After successfully taking the course, students are able to:

1. Describe and analyze different auction formats (first-price auction, second-price auctions, package auctions, share auctions, etc.) and discuss how they are implemented in practice.
2. Describe and analyze the basic matching problem and its extensions, and discuss how the algorithms to solve these problems are implemented in practice.

#### Course content

Traditional economics views markets as simply the confluence of supply and demand. A new field of economics, known as "market design," recognizes that well-functioning markets depend on detailed rules.

For example, supply and demand drive both stock markets and labor markets. But someone who wants to buy or sell shares in a company goes through very different procedures from those followed by a jobseeker or an employer. As another example, governments sell treasury bills and the rights to use radio spectrum in auctions, but the specific rules in the two auctions differ significantly.

Market designers try to understand these differences. They analyze the rules and procedures that make various kinds of markets work well or poorly. Their aim is to know the requirements of particular markets to fix them when they are broken, or to build markets from scratch when they're missing.

Market design studies two paradigmatic classes of market institutions: auctions and matching markets. This lecture gives an introduction to both of them. We will look at many examples and learn how market design helped to shape and improve such markets. Market design relies on some basic game theoretical tools, which we will also cover.

#### Course structure and indications of the learning and teaching design



The course consists of nine individual lectures and two exercise sessions. The last week of the course is reserved for the exam.

The first part (25.09-23.10) will cover auction theory. The second part (13.10-11.12) will cover matching markets. The specific applications to be covered may be subject to change. The structure of the lectures and exercises is as follows.

Date	Content	Literature
18.09.23	Introduction	Haeringer (2018, Chapter 1)
25.09.23	Auctions: Theory	Haeringer (2018, Chapter 2)
02.10.23	Auctions: Theory	Haeringer (2018, Chapter 4)
09.10.23	Spectrum Auctions	Haeringer (2018, Chapter 6)
16.10.23	Treasury Auctions	Haeringer (2018, Chapter 7)
23.10.23	Exercises	
13.11.23	The Basic Matching Model	Haeringer (2018, Chapter 9)
20.11.23	Assignment Problems	Haeringer (2018, Chapter 11)
27.11.23	Course Allocation	Haeringer (2018, Chapter 15)
04.12.23	Kidney Exchange	Haeringer (2018, Chapter 16)
11.12.23	Exercises	
18.12.23	Exam	

## Course literature

Haeringer, Guillaume. Market Design: Auctions and Matching. MIT Press, 2018.

## Additional course information

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## Examination information

### Examination sub part/s

#### 1. Examination sub part (1/1)

##### Examination modalities

Examination type	Digital written examination
Responsible for organisation	decentral
Examination form	Written exam
Examination mode	Digital
Time of examination	Term time
Examination execution	Synchronous
Examination location	On Campus
Grading type	Individual work individual grade
Weighting	100%
Duration	90 Min.

##### Examination languages

Question language: English

Answer language: English

##### Remark



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## Examination-aid rule

### Closed Book

The use of aids is prohibited as a matter of principle, with the exception of pocket calculator models of the Texas Instruments TI-30 series and, in case of non-language exams, bilingual dictionaries without any handwritten notes. Any other aids that are admissible must be explicitly listed by faculty members in the paragraph entitled "Supplementary aids" of the course and examination fact sheet; this list is exhaustive.

Procuring any aids, as well as ensuring their working order, is the exclusive responsibility of students.

## Supplementary aids

The examination will be conducted as a digital examination with the following admissible media:

- **Private notebook** (compulsory) – no tablets!
- **Mains adapter** (compulsory)
- External computer mouse (optional)
- External computer keyboard (optional)

We would like to point out explicitly that the examination cannot be taken with tablets/iPads.

You will need the following for the examination:

- Appliance and system requirements: [cf. StudentWeb](#)
- Special software: [LockDown Browser](#)
- HSG log-in including access modalities
- WLAN – operational access to Eduroam

Please make sure that

- all the updates have been carried out before the examination.
- In the run-up to digitally conducted examinations, technical tests (mock examinations without grades) are carried out. Participation is urgently required!
- You yourself are responsible for the perfect working order of your appliance, [cf. also StudentWeb](#).
- Keyboard stickers in the language in which the examination is conducted (such as English, German, as well as Arabic, Chinese, Russian, Japanese, etc. in language examinations) are permitted. The stickers must be identical with the original characters of the language concerned.

Any use of additional appliances that are not listed above will be strictly prohibited throughout the examination.

Any necessary actions with another software or additional appliances require the express prior approval of the persons in charge of the examination and are only permitted under supervision.

Any infringement of these rules of conduct may be sanctioned as an infringement of the rules of the University.

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## Examination content

All material covered in class, i.e., any lecture slides, the respective chapters in the text book used, the exercises discussed, and possibly additional lecture notes.

This includes in particular the following topics as described in the course content above: auctions (general theory, plus the applications we will discuss) and matching markets (general theory and the applications that we will discuss.)

## Examination relevant literature

Lecture content (slides, relevant chapters in the textbook, exercises, additional lecture notes if applicable) up until the final week.



## Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are binding and takes precedence over other information, such as information on StudyNet (Canvas), on lecturers' websites and information in lectures etc.

Any references and links to third-party content within the fact sheet are only of a supplementary, informative nature and lie outside the area of responsibility of the University of St.Gallen.

Documents and materials are only relevant for central examinations if they are available by the end of the lecture period (CW51) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 42 are relevant for testing.

Binding nature of the fact sheets:

- Course information as well as examination date (organised centrally/decentrally) and form of examination: from bidding start in CW 34 (Thursday, 24 August 2023);
- Examination information (supplementary aids, examination contents, examination literature) for decentralised examinations: in CW 42 (Monday, 16 October 2023);
- Examination information (supplementary aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 45 (Monday, 06 November 2023);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before the end of the de-registration period in CW 45 (Monday, 06 November 2023).