

# Module Description

## General information:

Module number:	IN2211
Title (dt.):	Auktionstheorie und Marktdesign
Title (en.):	Auction theory and market design
Module level:	Master
Abbreviation:	
Subtitle:	
Duration:	One semester
Occurrence - summer/winter:	Winter
Occurrence - regular/irregular:	Regular
Language:	English
Credits:	5*

\*Number of credits may vary according to degree program. Please see Transcript of Records.

## Workload:

Contact hours:	60
Self-study hours:	90
Total hours:	150

## Achievement and assessment methods:

Description of achievement and assessment methods:	The module examination is based on a written exam (If there are only few participants, an oral examination might be held instead of a written exam). By answering questions in text form, students have to show their understanding of game-theoretical concepts and auction theory and their knowledge of the properties of important models. By doing calculations, students have to demonstrate their ability to practically work with the mathematical models presented in the course. They have to discuss optimization models to solve central resource allocation problems in markets. Students are not allowed to use support material during the exam.
Type of assessment:	Written/oral
Duration of assessment (min):	60-90
Assessment retake:	End of semester

## Description:

(Recommended) prerequisites	IN0022 - Planen und Entscheiden in betrieblichen Informationssystemen
Content:	Game-theoretical solution concepts, mechanism design, single-item auction theory, combinatorial auctions, assignment markets, iterative combinatorial auctions, combinatorial clock auctions, approximation mechanisms, matching markets.

Intended learning outcomes:	After successful completion of the module, students are aware of game-theoretical solution concepts such as Nash equilibria or Bayes-Nash equilibria. They are able to understand the theoretical background of auction models such as the independent private values model. Students understand the computational hardness of allocation problems in multi-object auctions and know optimization models used in combinatorial and other multi-object auctions. Students understand when auction formats satisfy strong game-theoretical solution concepts where bidders have strong incentives to bid truthfully. They understand design desiderata in auction design and learn about the properties of auction formats as they are being used in the field. Most allocation problems in multi-object markets are computationally hard, such that students will also learn about approximation algorithms which solve the problem in polynomial time, but are truthful for bidders.
Teaching and learning methods:	Lectures with beamer presentation and mathematical proofs on the blackboard, exercise sheets with problems for preparation in homework, tutorials for discussion of solutions to exercise sheets, small group size in both lectures and tutorials allowing for intensive student support and interaction throughout the course.
Media:	Course presentation slides, white board, exercise sheets.
Reading list:	M. Bichler: A Course in Market Design. Models, Algorithms, Experiments, and Applications. Y. Shoham and K. Leyton-Brown: Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations.

<b>Responsible for module:</b>	
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<b>Lecturer:</b>	
1. Lecturer:	
First name:	Martin, Prof. Dr.
Name:	Bichler
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<b>Courses:</b>	
1. Course:	
Type:	Lecture
Name:	Auction Theory and Market Design
Weekly hours per semester:	2
2. Course:	
Type:	Exercise
Name:	Exercises for Auction Theory and Market Design
Weekly hours per semester:	2

<b>(Recommended) audience:</b>	
1. Program:	
Name:	MSc Finance & Information Management
2. Program:	

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Name:	MSc Informatics
2. Program: Name:	MSc Information Systems