

# Course Descriptions Master 2021-2022

Course Title                      Game Theory and Optimisation  
 Course Code                     EBC4188  
 ECTS Credits                    6,5  
 Assessment                      Whole/Half Grades

| Period | Period | Start     | End        | Mon | Tue | Wed | Thu | Fri |
|--------|--------|-----------|------------|-----|-----|-----|-----|-----|
| 1      |        | 30-8-2021 | 15-10-2021 | X   |     |     | X   |     |

Level                                Advanced

Coordinator                      Stan van Hoesel, Dries Vermeulen For more information:s.vanhoesel@maastrichtuniversity.nl;  
 d.vermeulen@maastrichtuniversity.nl

Language of instruction        English

Goals                                This course provides a comprehensive overview of optimization techniques such as linear and integer programming, and non-linear programming, with applications in game theory and economics. Students learn optimization techniques from mathematics and operations research, and how to apply them in models from game theory and economic theory.

Description                      Topics in optimization include duality theorems in LP, branch and bound and cutting plane algorithms in IP, and Kuhn-Tucker conditions for NLP.

Topics in game theory and economics include computation of Nash equilibrium and refinements and mechanism design.

Literature                         The course will be based on chapters from standard textbooks plus additional readers.

Recommended literature for background reading:

- \* Hans Peters : Game Theory : A Multi-Leveled Approach. Springer-Verlag.
- \* Stephen Boyd and Lieven Vandenbergh : Convex Optimization. Cambridge University Press.
- \* Roger Myerson : Game Theory : Analysis of Conflict. Harvard University Press.
- \* L.J. Vanderbei : Linear Programming - Foundations and Extensions. 4th Edition, Springer.
- \* Jorge Nocedal and Stephen J. Wright : Numerical Optimization. 2nd Edition, Springer.

Prerequisites                    Only Master students can take this course. Exchange students need to have obtained a BSc degree in Economics, International Business, Econometrics, or a related topic. Familiarity with the basic concepts of optimization and linear programming will be helpful. A solid basis in mathematics and calculus is also recommendable.

Teaching methods              PBL / Lecture

Assessment methods           Written Exam

Evaluation in previous academic year        For the complete evaluation of this course please click <http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM>

This course belongs to the following programme / specialisation

|                                                            |                             |
|------------------------------------------------------------|-----------------------------|
| Master Business Research - No specialisation               | Year 2 Free Elective(s)     |
| Master Business Research - Operations Research             | Year 1 Compulsory Course(s) |
| Master Econometrics and Operations Research                | Compulsory Course(s)        |
| Master Economic and Financial Research - Econometrics      | Year 1 Core Course(s)       |
| Master Economic and Financial Research - Econometrics      | Year 1 Elective Course(s)   |
| Master Economic and Financial Research - Econometrics      | Year 2 Elective Course(s)   |
| Master Economic and Financial Research - No specialisation | Year 2 Elective Course(s)   |
| SBE Exchange Master                                        | Master Exchange Courses     |
| SBE Non Degree Courses                                     | Master Courses              |