

## Course Descriptions Bachelor 2020-2021

Course Title Optimisation  
 Course Code EBC2105  
 ECTS Credits 6,5  
 Assessment Whole/Half Grades

Period	Start	End	Mon	Tue	Wed	Thu	Fri
1	31-8-2020	16-10-2020	X		X		X

Level Intermediate  
 Coordinator Stan van Hoesel For more information:s.vanhoesel@maastrichtuniversity.nl  
 Language of instruction English

Goals In this course the student will learn to solve both linear and non-linear constrained optimization problems.  
 Description PLEASE NOTE THAT THE INFORMATION ABOUT THE TEACHING AND ASSESSMENT METHOD(S) USED IN THIS COURSE IS WITH RESERVATION. THE INFORMATION PROVIDED HERE IS BASED ON THE COURSE SETUP PRIOR TO THE CORONAVIRUS CRISIS. AS A CONSEQUENCE OF THE CRISIS, COURSE COORDINATORS MAY BE FORCED TO CHANGE THE TEACHING AND ASSESSMENT METHODS USED. THE MOST UP-TO-DATE INFORMATION ABOUT THE TEACHING/ASSESSMENT METHOD(S) WILL BE AVAILABLE IN THE COURSE SYLLABUS.<br /><br />Optimisation problems arise in all fields that econometricians encounter, such as operations research, game theory, statistics, micro- and macroeconomics and finance. The aim of this course is to show the methodology for solving constraint optimisation problems both for linear and non-linear problems. These methodologies are also known as Linear and Non-Linear Programming, respectively. The following topics and techniques will be treated: the standard simplex method, duality, sensitivity analysis, the primal-dual simplex method, the network simplex method, first and second order necessary and sufficient conditions, the Lagrangian-function, Kuhn-Tucker conditions and constraint qualification. Besides this, special attention is paid to the application of these methodologies in practical problems.

Literature Course book.  
 Vanderbei, R.J., Linear Programming: Foundations and Extensions, 4th ed., Springer, 2014 (ISBN 978-1-4614-7629, DOI 10.1007/978-1-4614-7630-6).

Prerequisites Basic algebra (for linear programming), and advanced calculus (for nonlinear programming). Exchange students need to be aware that very specific pre-knowledge is required for this course. A solid background in mathematics is necessary. Students should be aware of the following concepts: Algebra: working knowledge of vector computing and matrices (including inverse matrices). Linear equations, and find the solutions of a set of equations etc.  
 Function theory on the level of optimisation of functions of multiple variables under side conditions (Lagrange multipliers)

Teaching methods An advanced level of English.  
 PBL / Lecture  
 Assessment methods Attendance / Participation / 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 Bachelor Econometrics and Operations Research Year 2 Compulsory Course(s)