

# Course Descriptions Master 2023-2024

Course Title Mathematical Research Tools  
 Course Code EBC4182  
 ECTS Credits 6,5  
 Assessment Whole/Half Grades

Period	Start	End	Mon	Tue	Wed	Thu	Fri
1	4-9-2023	20-10-2023		X		X	

Level Advanced  
 Coordinator Andrés Perea y Monsuwé For more information: [a.perea@maastrichtuniversity.nl](mailto:a.perea@maastrichtuniversity.nl)  
 Language of instruction English

Goals The goal of this course is learning how to find, classify and analyze solutions to optimization problems.  
 Description In economics and business we must often solve maximization or minimization problems. Think, for instance, of a firm that wants to minimize its costs while guaranteeing a certain production level, or investors that wish to find the optimal portfolio given a certain degree of risk. How do we find the solutions to such optimization problems, and how can we classify and analyze such solutions? This will be the main objective of this course. We will concentrate on four themes: (i) optimization problems without constraints, (ii) optimization problems with equality and inequality constraints, (iii) parametrized optimization, that is, how does the optimal solution change if we change the underlying parameters in the problem, and (iv) optimization in a dynamic setting with finite and infinite horizon.

Literature \* Rangarajan K. Sundaram: "A First Course in Optimization Theory", Cambridge University Press, 2011.

Prerequisites Basic level of mathematics (e.g. Sydsaetter et.al, Mathematics for Economic Analysis).

Teaching methods PBL / Lecture / Assignment

Assessment methods 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

Master Business Research - No specialisation	Year 2 Methodology Elective(s)
Master Business Research - Operations Research	Elective Course(s)
Master Economic and Financial Research - No specialisation	Year 1 Compulsory Course(s)