Course Descriptions None 2017-2018

Course Title	Allocations and Algorithms
Course Code	EBC2121
ECTS Credits	6,5
Assessment	Whole/Half Grades

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
4	5-2-2018	6-4-2018	X		X		

Level	Advanced
Coordinator	Matthias Mnich For more information:m.mnich@maastrichtuniversity.nl
Language of instruction	English
Goals	The aim of this course is to familiarize students with basic algorithm techniques and to give a short introduction to the field of algorithmic game theory. The students will also learn how to translate algorithmic ideas into working codes.
Description	In order to satisfy the Econometrics & OR curriculum, you have to choose two of the courses EBC2091, EBC2120, EBC2121, EBC2122 in period 4. Economic entities like companies, non-governmental Organisations, and municipalities are continuously faced with difficult logistics problems. Finding good solutions to these logistics problems is crucial for improving economic performance, and hence it comes by no surprise that the design of efficient algorithms for all kinds of optimization problems has been a flourishing area of research in computer science and operations research for many decades already. This course will introduce fundamental techniques in algorithm design (e.g., greedy algorithms, graph algorithms, convex programming, and local search) that are used to derive efficient algorithms and heuristics for various optimization problems. It will also be discussed how to translate algorithmic ideas into working code, and many exercises and small cases will be discussed. In the second part of this course a short introduction to algorithmic game theory will be given, a young area at the interface of economics and computer science. It deals with computational questions of economic models, like, for example, the question of how efficient equilibria can be in the worst case and how they are computed efficiently.
Literature	Select chapters from these two textbooks, which are available on the author's website for personal use: David P. Williamson and David B. Shmoys. The design of approximation algorithms. Cambridge University Press, 2011. Vijay V. Vazirai. Approximation Algorithms. Springer-Verlag New York, 2001.
Prerequisites	Basic courses in linear programming/algebra, basic knowledge of combinatorial optimisation (discrete Operations Research).
Teaching methods	PBL / Presentation / Lecture / Assignment / Papers / Groupwork
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

Bachelor Econometrics and Operations Research	Econometrics & OR Electives
Bachelor Econometrics and Operations Research	Year 3 Compulsory Courses