

Course Descriptions None 2023-2024

Course Title	Advanced Algorithms																
Course Code	EBC2121																
ECTS Credits	6,5																
Assessment	Whole/Half Grades																
Period	<table><thead><tr><th>Period</th><th>Start</th><th>End</th><th>Mon</th><th>Tue</th><th>Wed</th><th>Thu</th><th>Fri</th></tr></thead><tbody><tr><td>4</td><td>5-2-2024</td><td>28-3-2024</td><td>X</td><td></td><td>X</td><td></td><td></td></tr></tbody></table>	Period	Start	End	Mon	Tue	Wed	Thu	Fri	4	5-2-2024	28-3-2024	X		X		
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4	5-2-2024	28-3-2024	X		X												
Level	Advanced																
Coordinator	Lars Rohwedder For more information:l.rohwedder@maastrichtuniversity.nl																
Language of instruction	English																
Goals	The aim of this course is to familiarize students with advanced techniques from algorithm design and analysis. The students will also learn how to translate algorithmic ideas into working codes. The students will also get an introduction into the field of algorithmic game theory.																
Description	<p>In order to satisfy the Econometrics & OR curriculum, you have to choose two of the courses EBC2091, EBC2120, EBC2121, EBC2122 in period 4.</p> <p>Economic entities like companies, non-governmental Organisations, and municipalities are continuously faced with difficult optimization problems. Finding good solutions to these 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.</p> <p>This course will introduce fundamental techniques in algorithm design (e.g., greedy algorithms, graph algorithms, approximation algorithms) 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.</p>																
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 course in programming, basic course in linear programming, basic knowledge of combinatorial optimisation (discrete Operations Research).																
Teaching methods	Presentation / Lecture / Assignment / Groupwork																
Assessment methods	Final Paper / Written Exam / Assignment / Presentation																
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	<table><tbody><tr><td>Bachelor Econometrics and Operations Research</td><td>Year 3 Core Course(s)</td></tr><tr><td>Bachelor Econometrics and Operations Research</td><td>Year 3 Elective Course(s)</td></tr></tbody></table>	Bachelor Econometrics and Operations Research	Year 3 Core Course(s)	Bachelor Econometrics and Operations Research	Year 3 Elective Course(s)												
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