

# Course Descriptions Bachelor 2020-2021

Course Title Operations Research  
 Course Code EBC2106  
 ECTS Credits 6,5  
 Assessment Whole/Half Grades

| Period | Start    | End       | Mon | Tue | Wed | Thu | Fri |
|--------|----------|-----------|-----|-----|-----|-----|-----|
| 4      | 1-2-2021 | 26-3-2021 | L   |     | X   |     | X   |

Level Advanced

Coordinator Tjark Vredevelde For more information: [t.vredevelde@maastrichtuniversity.nl](mailto:t.vredevelde@maastrichtuniversity.nl)

Language of instruction English

Goals Application of deterministic and stochastic techniques to theoretical and practical optimisation problems in OR.

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. The course concentrates on algorithmic techniques to approach both theory and practice of problem solving in Operations Research. As a foundation, we start with an introduction to problem encoding and analysis of algorithms and computation times. The focus is then on classical problems from Combinatorial Optimisation, namely shortest path problems, minimum spanning trees, maximum flow and minimum cost flow problems. For all problems, one or several algorithms will be discussed and analysed in-depth. Finally, we study the foundations of stochastic processes and Markov Chains, with applications to the analysis of queues and queueing systems

Literature "Network Flows" by Akuj, Magnanti, and Orlin (chapters 2-7, 9, 12, 13). In addition, several chapters of other textbooks in Combinatorial Optimization and Operations Research, and own reader.

Prerequisites Analysis, linear algebra, basic probability theory, linear programming (modelling and solving), programming. Exchange students need to be aware that very specific pre-knowledge is required for this course. A solid background in mathematics is necessary.

Teaching methods PBL / Lecture / Assignment / Groupwork

Assessment methods Final Paper / 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) |
| SBE Exchange Bachelor                         | Bachelor Exchange Courses   |
| SBE Exchange Master                           | Bachelor Exchange Courses   |
| SBE Non Degree Courses                        | Bachelor Courses            |