

Course content for International Master program „Mathematical modeling, computation and optimization“

<b>Course name</b>	Discrete Optimization
<b>Contents and Objectives</b>	<p>Content:</p> <ul style="list-style-type: none"> <li>• optimization problems with discrete ground sets</li> <li>• theory and practical methods for linear optimization with integrality constraints (mixed integer programming)</li> <li>• relaxations and dual problems</li> <li>• algorithmic complexity</li> <li>• approximation algorithms</li> </ul> <p><u>Objectives of the course:</u> Practical optimization and planning problems typically comprise integrality constraints that model discrete decisions or discrete states. Besides teaching basic results of the field it enables to categorize and model these problems, to estimate their computational complexity and to choose or develop suitable algorithmic approaches.</p>
<b>Teaching</b>	This course consists of lectures (4h/week)
<b>Prerequisites</b>	Basic notions of Linear Algebra, Linear Optimization and Discrete Mathematics
<b>Examination</b>	Oral exam (30 minutes)
<b>Credits</b>	6 ECTS points
<b>Frequency</b>	This course is given at least every second year.
<b>Workload</b>	The estimated total working time for this course is 180 hours.
<b>Duration</b>	This course is given during one semester.