

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

<b>Course</b>	Singularity theory
<b>Content and Aims</b>	<p><u>Content:</u></p> <ul style="list-style-type: none"> <li>• Differentiable and holomorphic functions</li> <li>• Critical and non-degenerate points of such functions</li> <li>• The Morse lemma</li> <li>• Local rings, Lemma of Nakayama</li> <li>• Finite Determinancy</li> <li>• Classification of simple singularities</li> <li>• Deformations, Transversality</li> <li>• Versal Deformations of hypersurface singularities</li> </ul> <p><u>Aim of the course:</u> This lectures deals with so-called hypersurface singularities, which are special (critical) points of a differentiable or holomorphic function in several variables. The main topic of the lecture is the classification of such singularities together with some basic statements on their deformations.</p>
<b>Teaching</b>	<p>This course consists of lectures and exercise classes.</p> <ul style="list-style-type: none"> <li>• Lecture: Singularity theory (4h/week)</li> <li>• Exercise class: Singularity theory (2h/week)</li> </ul>
<b>Prerequisites</b>	Basic notions of Analysis, Linear Algebra and Higher Algebra
<b>Exams</b>	Oral exam (30 minutes)
<b>Credits</b>	8 ECTS points
<b>Frequency</b>	This course is given at least every second year.
<b>Working time</b>	The estimated total working time for this course is 240 hours.
<b>Duration</b>	This course is given during one semester.