<table>
<thead>
<tr>
<th>Title</th>
<th>Modelling of Steel Structures and Numerical Simulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester (optional)</td>
<td>2 or 4</td>
</tr>
<tr>
<td>Frequency</td>
<td>Once a year in the summer semester, At least 5 participants</td>
</tr>
<tr>
<td>Interval and duration</td>
<td>Weekly for 1 semester</td>
</tr>
<tr>
<td>ECTS / credit points</td>
<td>6 ECTS / 4 SWS</td>
</tr>
<tr>
<td>Workload</td>
<td>In-class study / online-study 45</td>
</tr>
<tr>
<td></td>
<td>Self-study 105</td>
</tr>
<tr>
<td></td>
<td>Exam preparation 30</td>
</tr>
<tr>
<td>Language of instruction</td>
<td>English</td>
</tr>
<tr>
<td>Module coordinator(s)</td>
<td>Prof. Dr.-Ing. Kraus, Matthias – Chair of Steel and Hybrid Structures</td>
</tr>
<tr>
<td>Usability / Type of module</td>
<td>Compulsory elective module in the subject area <em>Simulation and Validation</em> for the degree programme M.Sc. Digital Engineering</td>
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<tr>
<td></td>
<td>Compulsory elective module for the degree programme M.Sc. Natural Hazards and Risks in Structural Engineering</td>
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<tr>
<td>Formal requirements for participation</td>
<td></td>
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<tr>
<td>Recommended requirements for participation</td>
<td>Mechanics</td>
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<tr>
<td>Required examination (including partial exams if applicable)</td>
<td>Type Written exam</td>
</tr>
<tr>
<td>Requirements for exam registration</td>
<td></td>
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<tr>
<td>Language</td>
<td>English</td>
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<tr>
<td>Duration / Scope</td>
<td>120 min.</td>
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<tr>
<td>Weighting</td>
<td>Written exam (100 %)</td>
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<tr>
<td>Target qualifications</td>
<td>The students will be familiar with skills and expertise in the field of nonlinear structural analyses. Extensive knowledge of theoretical basics and modern modelling methods including numerical representations are the aim of the course. The students will acquire skills in handling advanced tools for the analysis and the design of structures.</td>
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<tr>
<td>Content</td>
<td>Design of steel structures using finite element methods; basics of the design; modelling of structures and loads; nonlinear material behaviour, numerical analyses of steel-members and structures regarding geometric and physical nonlinearities; stability behaviour of members including flexural and lateral torsional buckling</td>
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<tr>
<td>Teaching and learning forms/ Didactic concept</td>
<td>Lectures, exercises in lecture hall, exercises in computer pool, self-study</td>
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<td></td>
<td>Lectures provide the theoretical background, which is exemplarily applied to practical tasks in exercises including computer applications.</td>
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<tr>
<td>Literature and special information</td>
<td>Literature:</td>
</tr>
<tr>
<td></td>
<td>Kindmann, R., Kraus, M.: Steel Structures – Design using FEM. Ernst &amp; Sohn publishing, Berlin 2011</td>
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<tr>
<td></td>
<td>Internal lecture notes</td>
</tr>
<tr>
<td>Courses with SWS / ECTS</td>
<td>This module is comprised of:</td>
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<tr>
<td></td>
<td>&quot;Modelling of steel structures and numerical simulation&quot; (Lecture, 2 SWS)</td>
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<tr>
<td></td>
<td>&quot;Modelling of steel structures and numerical simulation&quot; (Exercise, 2 SWS)</td>
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