**Lehrform (teaching format) / SWS (hours per week):** 2K

**Kreditpunkte (credit points):** 3

**Turnus (frequency):** usually, each summer term (during the semester break)

**Inhaltliche Voraussetzungen (content-related prior knowledge/skills):** no prerequisites, some background in discrete optimization or operations research is helpful

**Sprache (language):** English

**Lehrende (teaching staff):** AG Kombinatorische Optimierung und Logistik (Prof. Dr. Nicole Megow, u.a.)

<table>
<thead>
<tr>
<th>Studiengang (degree program)</th>
<th>Module</th>
<th>Semester</th>
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</thead>
<tbody>
<tr>
<td>Informatik (Bachelor)</td>
<td>Freie Wahl</td>
<td>ab 4.Sem.</td>
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<tr>
<td>Informatik (Master)</td>
<td>General Studies</td>
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<tr>
<td>Mathematik</td>
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**Lernergebnisse / Learning Outcome:**

- to be able to model optimization problems as (integer) linear programs, (I)LPs
- to know how to implement a model in optimization software such as CPLEX and know of several features of the software
- to be able to analyze CPLEX outputs on solution quality and running times
- to know some techniques to solve large problems
- to have basic knowledge of the theoretical background of linear optimization and methods for solving ILPs

**Inhalte / Contents:**

- Modeling linear and integer linear programs
- How to use CPLEX
- Geometry of linear programming, duality
- Methods for solving integer linear programs: cutting planes, branch and bound, column generation

**Hinweise (remarks):** The table lists only the primary / most specific modules to which this course is assigned.