## Concepts of Molecular Chemistry 2

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Module</th>
<th>Workload</th>
<th>Credit points</th>
<th>Available in semester</th>
<th>Frequency each SuS</th>
<th>Course duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
<td>150 h</td>
<td>5 CP</td>
<td>2</td>
<td></td>
<td>1 semester</td>
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</tbody>
</table>

### 1. Teaching Methods
- a) Lectures
- b) Exercises

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Contact time</th>
<th>Self-study</th>
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<tbody>
<tr>
<td>a) 2 h</td>
<td>45 h</td>
<td>105 h</td>
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<tr>
<td>b) 1 h</td>
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### 2. Learning objectives
Students possess advanced knowledge of the interpretation of the electronic structure, properties and reactivities of organometallic, inorganic molecular and solid state compounds and systems of higher and lower dimensionality. They can explain the application of spectroscopic methods to the characterization of inorganic solid state materials, molecular compounds and complexes. Students can apply learned concepts on unknown compounds and thus deduce reactivities and chemical properties.

### 3. Soft skills: methodological, self, social competences
- Structure, summarize, and revise principal lecture contents, identify and consult relevant literature; interactively present in front of an audience
- Develop study strategies, independently assess their effectiveness, and adapt/optimize them as needed
- Learn and work cooperatively, effectively communicate scientific contents to peers

### 4. Prerequisite(s)
Basic general knowledge of synthetic chemistry (organic and inorganic chemistry) and the structure of molecular compounds, complexes (molecular orbitals, Lewis structures) is recommended

### 5. Evaluation of the learning process
- Active participation during lectures, homework corrected by teaching assistant and/or interactive presentation of homework during exercises

### 6. Mode of examination
- 2-hour end-of-term written exam

### 7. Requirements for acquiring credit points
- Passing the written examination

### 8. Significance for overall grade
- Weighted according to CPs

### 9. Module contents
Reactivity, properties and electronic structure of organometallic, inorganic and bioinorganic compounds. Content may include one or several of the following topics:
- Concepts of organometallic chemistry: Stabilization of reactive intermediates, control of electronic and steric properties of ligands, applications in homogenous catalysis, trends in the periodic table
- Concepts of bioinorganic chemistry and medicinal chemistry
- Concepts in inorganic solid state and materials chemistry
- Application of spectroscopic methods for the characterization of inorganic solid state materials, molecular compounds and complexes and the elucidation of reaction mechanisms; computational methods in structure elucidation and mechanistic studies
- Modern trends in organometallic, inorganic and/or bioinorganic chemistry
<table>
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<tr>
<th>10</th>
<th><strong>Person in charge / Lecturer(s)</strong></th>
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<tbody>
<tr>
<td></td>
<td>Prof. Dr. Däschlein-Gessner</td>
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<td></td>
<td>V. Däschlein-Gessner, N. Metzler-Nolte, A. Devi</td>
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