<table>
<thead>
<tr>
<th>Module</th>
<th>Photonics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>new</td>
</tr>
<tr>
<td>Instruction language</td>
<td>English</td>
</tr>
<tr>
<td>ECTS credits</td>
<td>6</td>
</tr>
<tr>
<td>Attendance time</td>
<td>5 hours per week</td>
</tr>
<tr>
<td>Duration</td>
<td>1 semester</td>
</tr>
<tr>
<td>Cycle</td>
<td>Each winter semester</td>
</tr>
<tr>
<td>Coordinator</td>
<td>Dean of Physics Studies</td>
</tr>
<tr>
<td>Instructors</td>
<td>Prof. Ana Predojević</td>
</tr>
</tbody>
</table>
| Allocation to study programmes | Physics M.Sc., elective module, 1st or 2nd semester  
Wirtschaftsphysik M.Sc., elective module, 1st - 3rd semester |
| Formal prerequisites | None |
| Recommended prerequisites | Knowledge of Optics, Semiconductor Physics and/or Quantum Optics |
| Learning objectives | Students who successfully passed this module  
- are familiar with the fundamental topics relevant for the fields of photonics  
- know how to focus on optics and semiconductor physics aspects of photonics with respects to quantum optics. |
| Syllabus | Harmonic generation: nonlinearity, birefringence, and periodic poling  
Methods of parametric down-conversion: entanglement and squeezed light  
Interferometry with non-classical light  
Testing light: quality vs. quantity  
Quantum dots: structure  
Semiconductor single photon devices  
Quantum dots as photon pair emitters  
Quantum dot as memory  
Photonic crystal cavities  
Storage of quantum light in solid state  
Laser written photonics circuits  
Waveguides  
Superconductors as detectors |
| Literature | Will be announced by the lecturer |
| Teaching and learning methods | Lecture (3 hours per week)  
Exercise (2 hours per week) |
| Workload | 45 hours lecture (attendance time)  
30 hours exercise (attendance time)  
105 hours self-study and exam preparation  
Total: 180 hours |
| Assessment | Written or oral examination. A prerequisite for the participation in the |
examination is an ungraded course achievement. Form and scope of the examination and of the course achievement are determined and notified by the instructor at the beginning of the course.

<table>
<thead>
<tr>
<th><strong>Examination</strong></th>
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<tbody>
<tr>
<td><strong>Grading procedure</strong></td>
<td>The module grade is the examination grade.</td>
</tr>
<tr>
<td><strong>Basis for</strong></td>
<td>Research in the fields of Quantum Information and Technologies</td>
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</table>