1. **Module title:** Computer and Microcontroller Technology

2. **Field / responsibility of:** Physics / the department, the Dean of Studies

3. **Module contents:**
   - The structure of a computer system
   - Operation and instruction set of a standard microprocessor
   - Hardware-related programming
   - Interfaces with peripheral devices
   - Technical use of microcontrollers, real-time behavior
   - Modern concepts to improve the performance of computer systems

4. **Qualification objectives of the module / competencies to be acquired:**
   - Understanding of the inner workings of a computer and insight into the technical use of computers

5. **Prerequisites for participation:**
   a) **Recommended knowledge:** Good knowledge of a (higher) programming language
   b) **Prerequisite courses:** None

6. **Module can be used for:**
   - M.Sc. (and B.Sc.) in Physics, Nanoscience, Computational Science, Teacher Training for Academic Secondary School, Teacher Training for Physics

7. **Module is offered:** On a semiannual basis

8. **Module can be completed in:** 1 semester

9. **Recommended semester of study:** 1

10. **Overall module workload / number of credit points:**
    - **Workload:**
      - Total number of hours: 180
      - Allocation:
        1. Attendance: 4 credit hours
        2. Independent study (including exam preparation/exam): 120 hours
      - Credit points: 6

    The successful completion of all assignments listed in items 11 and 12 is a prerequisite for receiving the credit points mentioned in item 10.

11. **Module components:**

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Req./req. elective</th>
<th>Form of teaching</th>
<th>Subject area/topic</th>
<th>Credit hours</th>
<th>Coursework</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY-M-VS 07.1</td>
<td>Compulsory</td>
<td>Lecture Practical course</td>
<td>Computer and microcontroller technology</td>
<td>4</td>
<td>Successful completion of the practical exercises across all course topics; project work</td>
</tr>
</tbody>
</table>

12. **Module exam:**

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Competence / topic</th>
<th>Type of exam</th>
<th>Duration</th>
<th>Time / notes</th>
<th>Weighting for module grade</th>
</tr>
</thead>
</table>