Code: MscTI_QCH		Course Title: Quantum Computing Hardware	
Module Coordinator: JProf. Dr. Marko Rančić		**Type:** Lecture with exercises	
Credit points: ?	**Workload:** 180h	**Teaching Hours:** 4 / week	**Term:** WT

Module Parts and Teaching Methods:
• Lecture (3-2 h / week)
• Practical exercises with homework (1-2 h / week)

Objectives:
By the end of this lecture, the students will be able to:
• Understand the basic hardware approaches to quantum computing
• Understand the basis of cryogenic technology involved in quantum computing
• Understand quantum computing hardware roadmaps

Content:
• Introduction to quantum mechanics
• Introduction to quantum computing
• Selected topics in condensed matter and atomic physics
• Superconducting qubits (transmons)
• Photonic qubits
• Trapped ion qubits
• Cold atoms in optical lattices
• Spin Qubits
• Nitrogen vacancy centers in diamond qubits
• Topological Qubits
• Quantum Error correction: Toric code
• Quantum Error correction: Wen plaquette model

Prerequisites: none	**Recommended Knowledge:** Basic Quantum Mechanics

Literature:
• Lecture Notes and Handouts
• A list of sources that will be provided in the course

Testing: Defined by the lecturer before the beginning of the course