

Lehrform (*teaching format*) / **SWS** (*hours per week*): 2VL + 2UE

Kreditpunkte (*credit points*): 6

Turnus (*frequency*): usually, each winter term

Inhaltliche Voraussetzungen (*content-related prior knowledge/skills*): none

Sprache (*language*): English

Lehrende (*teaching staff*): AG Software Engineering für Kognitive Robotik und Systeme (Prof. Dr. Nico Hochgeschwender)

Studiengang (<i>degree program</i>)	Module	Semester
Informatik (Master)	IMAP, IMA-AI	ab 1.Sem.
AI and Intelligent Systems (Master)	M-CER	from 2nd sem.
Informatik (Bachelor)	(nur <i>Freie Wahl</i>)	

Lernergebnisse / *Learning Outcome*:

- To be able to communicate in the terminology of the field of robot software engineering and classify components, methods and tools using this terminology.
- To be able to critically reflect on relevant standards and norms in the field of cognitive robotics.
- To be able to identify and formulate requirements for cognitive robots.
- To be able to identify and decompose cognitive functions and to specify robust, cognitive robot control architectures.
- To be able to specify and execute testing and evaluation campaigns of cognitive robots.

Inhalte / *Contents*:

- Cognitive robots and desirable characteristics
- Software engineering challenges related to cognitive robots (e.g., safety, robustness, adaptability)
- Relevant standards and norms in the field of cognitive robots and their limitations (e.g., safety standards)
- Component-based cognitive robot software architectures (e.g., ROS 2)
- Monitoring (e.g., execution and safety monitoring, meta-cognition)
- Behaviour specifications (e.g., behaviour trees)
- Benchmarking and performance evaluation (e.g., metrics and evaluation protocols)
- Evolving non-functional requirements for cognitive robots (e.g., transparency, explainability)

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