03-IMVP-TCRS	Trustworthy Cognitive Robots and Systems

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

Kreditpunkte *(credit points)*: 6

Turnus *(frequency)*: every 2 years

Inhaltliche Voraussetzungen *(content-related prior knowledge/skills)*: Foundations in Robotics and AI

Sprache *(language)*: English

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

Studiengang *(degree program)*	Module	Semester
Informatik (Master)	IMVP, IMVP-AI	ab 1.Sem.
AI and Intelligent Systems (Master)	AI-M-CER	from 2nd sem.
Informatik (Bachelor)	(nur *Freie Wahl*)	

Lernergebnisse / *Learning Outcome*:

- To be able to communicate in the terminology of the field of trustworthy cognitive robots and systems and to classify methods, concepts, components and tools using this terminology.
- To be able to assess the trustworthiness of cognitive robots and systems
- To be able to identify key ethical concerns associated with cognitive robots and systems
- To be able to select and apply measures that could be adopted to mitigate concerns related to trustworthiness

Inhalte / *Contents*:

- Engineering ethics and common ethical principles and debates (e.g., descriptive vs. prescriptive ethics)
- Methods for performing risk assessment (e.g., STPA, hazard analysis)
- Case studies of transparency, trustworthiness, predictability and explainability
- Methods and techniques for making learning-enabled data-driven components more robust and dependable (e.g., out-of-distribution detection, runtime monitoring)
- Relevant standards and norms (e.g., IEEE P7000 series) for trustworthy systems
- Trustworthiness in the context of human-robot collaboration (e.g., safety standards ISO 15066, responsible design, human-awareness)
- Value-based engineering

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