# Software-Development for Industrial Robotics

**Winter**

(engl. Software-Development for Industrial Robotics )

## Modulnummer: FIN-INF-120273

| Kürzel | CP | Semester | Fachsem. | Dauer | Sprache | Niveau |
|---|---|---|---|---|---|---|
| SDIR | 6 | Winter | ab 1. | 1 Semester | deutsch | Master |

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|---|---|
| **Link zum LSF:** | LSF |
| **Zugang beschränkt:** | true |
| **Verantwortung:** | Prof. Dr. Frank Ortmeier |
| **Dozent:in:** | Prof. Dr. Frank Ortmeier |
| **Lehrveranstaltungen:** | • Vorlesung *Software-Development for Industrial Robotics*<br>• Übung *Software-Development for Industrial Robotics* |
| **Verwendbarkeit:** | - M.Sc. INF: Informatik<br>- M.Sc. INGINF: Informatik<br>- M.Sc. INGINF: Ingenieurinformatik<br>- M.Sc. WIF: Informatik<br>- M.Sc. DKE: Applied Data Science<br>- M.Sc. DE: Methoden des Digital Engineering<br>- M.Sc. DE: Methoden der Informatik<br>- M.Sc. DE: Fachliche Spezialisierung<br>- M.Sc. VC: Computer Science |

**Angestrebte Lernergebnisse:**
The students have ...

- Understanding of problems in the robotics domain

- Understanding and applicability of the mathematical background
- Practical experience in programming industrial robots on the basis of various tasks

**Inhalt:**
The use of industrial robots is increasing rapidly these days. In 2014, the expected number of industrial robots increased by 27% compared to the previous year. The main reason is their flexibility, especially their ability to perform a wide range of tasks. In the lecture “Software Development for Industrial Robotics” an overview of this domain is given as well as the mathematical background. The latter deals in particular with the idea of forward and inverse kinematics, point-to-point movements, linear movements, trajectory planning, recognition of singularities, Denavit-Hartenberg convention, rotation and translation matrices. The final project deals with control using a collision-free path planner, KUKA youBot kinematics, numerical approaches to solving inverse kinematics, etc.

**Arbeitsaufwand:**
180h = 56h attendance time + 124h independent work

| **Prüfungsvorleistungen:** | **Studien-/Prüfungsleistungen:** | **Lehrform / SWS:** |
|---|---|---|
| Projekt | mündliche Prüfung | • Lecture (2 SWS)<br>• Exercise (2 SWS) |

| **Voraussetzungen nach Prüfungsordnung:** | **Empfohlene Voraussetzungen:** |
|---|---|
| none | |

| **Medienformen:** | **Literatur:** |
|---|---|
| | |

**Hinweise:**
Zuangsbeschränkung: Limitierte Teilnehmerzahl. Auswahlverfahren wird in erster Vorlesung bekannt gegeben

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Revision #1
Created 2026-11-19 09:55:33 UTC by Fakultät für Informatik
Updated 2026-11-19 09:55:33 UTC by Fakultät für Informatik