

Module title Robotics				
Module code ROB	Level Bachelor (B.Sc.)	Hours per week 4	ECTS credits 5	Duration 1 semester
Module instructor Prof. Dr. Weiß	Lecture type Interactive seminar with integrated exercises	Prerequisite(s) Analysis 1 and 2, Linear Algebra 1 and 2, Programming 1, Mathematical Software, Numerical Mathematics		Grading Final exam (written or oral)
Objectives				
<ul style="list-style-type: none"> • Knowledge of mathematical concepts of robotics • Knowledge of the an industrial robot controller, a common robot programming language, and a simulation environment for industrial robots • Ability to develop standard robotic applications: pick-and-place, handling, contour programming 				
Content				
<ul style="list-style-type: none"> • Description of coordinate systems, in particular orientation • Kinematic model: open and closed kinematic chains, forwards and backwards transformation • Dynamic Model: Newton-Euler algorithm • Calibration, object registration, sensors • Path planning and velocity profile Planning • Implementing procedures with MATLAB, KRL, ROS 				
Textbook/teaching material				
<ul style="list-style-type: none"> • Corke, Peter: Robotics, Vision and Control: Fundamental Algorithms in MATLAB • Craig, John J .: Introduction to Robotics • Laumond, Jean-Paul: Robot Motion Planning and Control • LaValle, Steven M .: Planning Algorithms 				

Note: this is not the official course descriptor according to the "Studien- und Prüfungsordnung" (SPO)