

## Robotics 2: Modeling, Analysis, and Control 2020 Summer

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| Organizer | Prof. Dr. Jochen Steil                     |
| Lecturer  | Dr. Bertold Bongardt                       |
| Exercises | Sinan Barut, Sven Tittel, Bertold Bongardt |

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| Format | 2 SWS (L) + 2 SWS (E)                           |
| Times  | Mon, 11:30 – 13:00 (L) + Wed, 09:45 – 11:15 (E) |
| Rooms  | PK 4.1 (L) + SN 19.4 (E)                        |

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| Module        | INF-ROB-45 |
| Credit points | 5          |

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### Goals

Based on the course ‘Robotics 1: Technical and Mathematical Foundations’ in the previous winter semester, we intensify the study of robotics in the second term. Using the fundamental concepts studied in the first lecture, we focus on more practical issues arising in robotics in the second lecture. Attending ‘Robotics 2’, you prepare to attend the advanced robotics classes offered by the IRP.

### Audience

Students of Computer Science and STEM (Science, Technology, Engineering and Mathematics)

### Literature

Relevant reading material will be announced in the lecture

### Overview

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| Block | Date       | Topics                               |
|-------|------------|--------------------------------------|
| 01    | 2020-04-15 | Introduction: Review and Preview     |
| 02    | 2020-04-20 | System Control and Robotics Software |
| 03    | 2020-04-27 | Introduction to Dynamics             |
| 04    | 2020-05-04 | Advanced Techniques of Robot Control |
| 05    | 2020-05-11 | Plans and Trajectories               |
| 06    | 2020-05-18 | Principles of Sensing and Measuring  |
| 07    | 2020-05-25 | Robot Programming: Fundamentals      |

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| 08 | 2020-06-08 | Robot Programming: Tools, Components, Schemata |
| 09 | 2020-06-15 | Aspects of Design and Geometry                 |
| 10 | 2020-06-22 | Mechanisms, Graphs, and Matrices               |

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| 11 | 2020-06-24 | Tools for General Geometries                 |
| 12 | 2020-07-06 | Configurations, Modes, Redundancy            |
| 13 | 2020-07-13 | Algebraic Constraints and Workspace Analysis |
| 14 | 2020-07-20 | Non-Rigidity: Contact, Haptics, Elasticity   |

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