# Mobile Robots

<table>
<thead>
<tr>
<th>Course (Abbreviation)</th>
<th>Type/ SWS</th>
<th>Presence</th>
<th>Self Study</th>
<th>Credit Points</th>
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<tr>
<td>a) Mobile Robots (MR)</td>
<td>Lecture/ 1 SWS</td>
<td>15 h</td>
<td>45 h</td>
<td>2</td>
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<tr>
<td>b) Mobile Robots (MR)</td>
<td>Tutorial/ 2 SWS</td>
<td>25 h</td>
<td>65 h</td>
<td>3</td>
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## Language
English

## Content
1. Robot Operating System (ROS)
2. Robotics System Toolbox Matlab
3. Sensors, actuators and kinematics of mobile robots
4. Homing and trajectory following
5. Obstacle avoidance
6. Localisation
7. Path planning
8. Online trajectory optimization
9. Mapping and SLAM

**Literature:**
Siciliano, Khatib: Springer Handbook of Robotics
selected papers on mobile robotics from journals and conferences

## Competencies
The students acquire a profound knowledge of fundamental concepts and practical experience on mobile robots. Students are able to solve mobile robotic tasks such as obstacle avoidance, navigation and localization in a self-dependent manner with selected methods and algorithms in ROS/Matlab.

## Examination Requirements
- successful completion of 75% programming assignments (prerequisite for eligibility to the written exam
- written exam

## Formality of Examination
- Module Finals
- Accumulated Grade

## Module Requirements (Prerequisites)

## Allocation to Curriculum:
- Program: Automation & Robotics, Field of study: Robotics, Cognitive Systems

## Responsibility/ Lecturer
apl. Prof. Dr. F. Hoffmann / apl. Prof. Dr. F. Hoffmann