# ROBOT AND INTERFACE MECHANISMS

<table>
<thead>
<tr>
<th>Rota annually SS</th>
<th>Duration 1 Semester</th>
<th>Semester X. (Semester)</th>
<th>SWS 3 SWS</th>
<th>Credit Points 5</th>
<th>Workload 150 h</th>
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## 1 Modul Structure

<table>
<thead>
<tr>
<th>Course (Abbreviation)</th>
<th>Type/ SWS</th>
<th>Presence</th>
<th>Self Study</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Robot and interface mechanisms</td>
<td>Lecture/ 1 SWS</td>
<td>15 h</td>
<td>40 h</td>
<td>2</td>
</tr>
<tr>
<td>b) Robot and interface mechanisms</td>
<td>Tutorial/ 1 SWS</td>
<td>15 h</td>
<td>40 h</td>
<td>2</td>
</tr>
<tr>
<td>c) Robot and interface mechanisms</td>
<td>Practical training / 1 SWS</td>
<td>15 h</td>
<td>40 h</td>
<td>1</td>
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## 2 Language

English

## 3 Content

1. Mechanical components
   - a. Energy conductors and transformers
   - b. Control elements and energy storages

2. Robot mechanisms
   - a. Joints and mechanisms
   - b. Direct and inverse kinematics
   - c. Evaluation of mechanisms

3. Human-robot interfaces
   - a. Sensors and stimulators
   - b. Kinematic design
   - c. Interface systems

The laboratory part will be a mini design project in which student groups will create their own low-budget haptic human-machine interfaces.

## 4 Competencies

On successful completion of this module, students will be able to:

1. Distinguish basic mechanical components and select them appropriately in mechanism design.
2. Understand robot mechanisms and apply kinematic calculations for their design and control.
3. Know components of human-robot interfaces and be able to design such systematically.

## 5 Examination Requirements

Presentation (15 minutes) and oral exam (max. 30 minutes)

## 6 Formality of Examination

☐ Module Finals
☒ Accumulated Grade

## 7 Module Requirements (Prerequisites)

## 8 Allocation to Curriculum:

Program: Automation & Robotics; Field of study: Robotics, Cognitive Systems

## 9 Responsibility/ Lecturer

JProf. Dr.-Ing. Philipp Beckerle