**COURSE DESCRIPTION – ACADEMIC YEAR 2023/2024**

<table>
<thead>
<tr>
<th>Course title</th>
<th>Introduction to robot control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course code</td>
<td>43079</td>
</tr>
<tr>
<td>Scientific sector</td>
<td>ING-INF/04</td>
</tr>
<tr>
<td>Degree</td>
<td>Bachelor in Industrial and Mechanical Engineering (L9)</td>
</tr>
<tr>
<td>Semester</td>
<td>1</td>
</tr>
<tr>
<td>Year</td>
<td>3</td>
</tr>
<tr>
<td>Credits</td>
<td>6</td>
</tr>
<tr>
<td>Modular</td>
<td>No</td>
</tr>
<tr>
<td>Total lecturing hours</td>
<td>36</td>
</tr>
<tr>
<td>Total lab hours</td>
<td>24</td>
</tr>
<tr>
<td>Attendance</td>
<td>Recommended</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Lectures and exercises of Mathematical Analysis I and II, Geometry, Physics I, Mechanics of Machinery</td>
</tr>
<tr>
<td>Course page</td>
<td><a href="https://ole.unibz.it/">https://ole.unibz.it/</a></td>
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**Specific educational objectives**
The course belongs to the type "free choice course". It is designed for acquiring professional skills and knowledge.

**Lecturer**
Prof. Angelika Peer,
[https://www.unibz.it/it/faculties/engineering/academic-staff/person/38684-angelika-peer](https://www.unibz.it/it/faculties/engineering/academic-staff/person/38684-angelika-peer)

**Contact**
NOI Techpark A1.4.29A, angelika.peer@unibz.it, phone: +39 0471 017 766

**Scientific sector of lecturer**
ING-INF/04 – AUTOMATION

**Teaching language**
English

**Office hours**
After consultation and agreement with lecturer

**Lecturing Assistant (if any)**
- 

**Contact LA**
- 

**Office hours LA**
- 

**List of topics**
- Robot kinematics and dynamics
- Trajectory planning
- Motion control
- Interaction control
- Vision-based control
- Remote control
- Computer-aided simulation and design

**Teaching format**
The lessons are divided into frontal classroom lessons, and exercises to be solved alone or in a group with the help of Matlab/Simulink.

**Learning outcomes**
Knowledge and understanding
Knowledge and understanding in the field of:
1. Theory of control of robot manipulators

Applying knowledge and understanding
2. Ability to apply knowledge for solving given problems, including solving them with numerical data and with the help of software packages like Matlab/Simulink.

Making judgements
3. Ability to judge plausibility of results.

Communication skills

Ability to learn
5. Learning skills to independently study and apply methods of systems and control for specific applications beyond topics covered in this lecture.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Oral: oral exam (30 min) with verification questions</th>
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<tbody>
<tr>
<td>Assessment language</td>
<td>English</td>
</tr>
<tr>
<td>Assessment Typology</td>
<td>Monocratic (Collegiale se esame modulare)</td>
</tr>
</tbody>
</table>
| Evaluation criteria and criteria for awarding marks | • clarity and correctness of answers;  
• soundness of the sketched approach to address a problem and the single steps involved;  
• ability to summarize, evaluate, and establish relationships between topics;  
• correct usage of terminology |

Required readings
- Blackboard and slides
- Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it

Supplementary readings
- Introduction to Robotics – Mechanics and Control, John Craig, Pearson, 2018
- Modelling, Indentification & Control of Robots, W. Khalil & E. Dombre, Kogan Page Science, 2004

Software used
Matlab/Simulink