Syllabus

Course title: Systems and Control Lab
Course code: 42167
Scientific sector: ING-INF/04
Degree: Bachelor in Industrial and Mechanical Engineering
Semester: II
Year: III
Academic Year: 2020-21
Credits: 6
Modular: Yes

Total lecturing hours
Total lab hours
Total exercise hours: 60
Attendance: Recommended
Prerequisites:
- Lectures and exercises of Mathematical Analysis I and II,
- Geometry, and Physics I

Course page: The student should understand the basic principles of the theory of modelling and control of linear systems and their practical implementation is simulation and with a real robot.

Lecturer:
Name: Marco Frego, PhD,
Email: marco.frego@unibz.it
Website: https://www.unibz.it/en/faculties/sciencetechnology/academic-staff/person/44497-marco-frego

Scientific sector of the lecturer: ING-INF/04 – AUTOMATION
Teaching language: English
Office hours: After agreement with the lecturer
Teaching assistant (if any):
Office hours:

List of topics covered:
1. Introduction to Matlab
2. Basics of Simulink
3. Dynamic systems in the frequency domain
4. Application to robot control in the lab experiences

Teaching format: The lessons are divided into theoretical online lessons, exercises on the blackboard and exercises with simulation software, hand-on experience in the lab with robots.

Learning outcomes (ILOs): The learning outcomes need to refer to the Dublin Descriptors.
Knowledge and understanding

1. Matlab/Simulink computational tools and theory and practice of linear control systems.

Applying knowledge and understanding

2. Application of Matlab and Simulink to control problems, in simulation and with the robotic systems.

Making judgements

3. Ability to judge plausibility of results.

Communication skills


Ability to learn

5. Use the skills learnt in the course to autonomously extend the knowledge of programming and implementing control systems.

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<th>Assessment language</th>
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<td>English</td>
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<tr>
<th>Evaluation criteria and criteria for awarding marks</th>
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<tr>
<td>The exam includes exercises to be solved with Matlab and Simulink, involving mathematical methods for control problems. Judged will be the formal and methodological correctness of the answers, the computations and their presentation and analysis.</td>
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<td>Required readings</td>
<td>Lecture Material</td>
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<td><strong>Supplementary readings</strong></td>
<td>There is a vast literature on Matlab/Simulink, Any book that covers the basics will work. Some suggestions:</td>
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<td>Angermann, Rau, Beuschel, Wohlfarth - MATLAB, Simulink, Stateflow - De Gruyter (in German) 9th ed. 2017</td>
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