Syllabus

Course Description

Course Title	Automatic Control
Course Code	47511
Course Title Additional	
Scientific-Disciplinary Sector	IINF-04/A
Language	English
Degree Course	Master in Industrial Mechanical Engineering
Other Degree Courses (Loaned)	
Lecturers	Prof. Karl Dietrich von Ellenrieder, Karl.vonEllenrieder@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/37038
Teaching Assistant	
Semester	First semester
Course Year/s	1
CP	5
Teaching Hours	28
Lab Hours	18
Individual Study Hours	79
Planned Office Hours	15
Contents Summary	The course provides an introduction to the fundamentals of control theory, at an introductory/intermediate level. Topics covered include: Laplace Transform, Root Locus, Frequency Design Methods and State Space Techniques (time permitting). The course is aimed at beginning graduate students and focuses on building understanding and intuition. Examples and exercises that use Matlab and Simulink will be given.
Course Topics	The basic principles of stability and automatic control for linear time-invariant systems are presented.
Keywords	Automatic Control, Stability, Linear Time-Invariant Systems

Recommended Prerequisites	None.
Propaedeutic Courses	
Teaching Format	Classroom lectures and exercises.
Mandatory Attendance	Attendance at lectures is strongly recommended. Attendance at exercise sessions is required.
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding: 1. Applying basic feedback principles to a broad range of dynamic system models (such as those typically learned in the 1st cycle). 2. Defining feedback loop requirements for improving system steady state response. 3. Understanding conditions that guarantee closed loop system stability. 4. How to design controllers via Root Locus, Frequency Response and State Space Techniques. Applying knowledge and understanding: 5. Analyzing, developing and presenting control systems for applications that span multiple disciplines through exercises, which complement the lectures. Making judgements: 6. On the choice of analytical and numerical tools to use in the exercises. This may require you to integrate knowledge, handle complexity, and formulate judgements with incomplete data. Communication skills 7. In-class exercises will require you justify your solutions/conclusions concisely (in clear and simple language). Learning Skills: 8. Students will be required to develop a proficiency in Matlab and Simulink with a few in-class examples, but mostly on their own. This is intended to help students develop the ability to study in a manner that is largely self-directed or autonomous.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	- Formative assessment:

	Exercises: 20 hours total; ILOs assessed: 1 - 8; - Summative assessment: 15% exercises; ILOs assessed: 1 - 8; 85% final exam: 4 hours; ILOs assessed: 1 - 6.
Evaluation Criteria	In-Class Exercises: Completeness and correctness of answers; level of understanding Written Final Exam: Completeness and correctness of answers. Students are required to receive an overall grade of greater than 60/100 points in order to pass the course.
Required Readings	Lecture notes and exercises will be available on the UniBZ Open Learning Environment (OLE).
Supplementary Readings	Additional books and articles may be recommended by the instructor during the course.
Further Information	
Sustainable Development Goals (SDGs)	Quality education