Syllabus

Descrizione corso

Titolo insegnamento	Automatic Control
Codice insegnamento	47511
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	ING-INF/04
Lingua	Inglese
Corso di Studio	Corso di laurea magistrale in Ingegneria Industriale Meccanica
Altri Corsi di Studio (mutuati)	
Docenti	prof. Karl Dietrich von Ellenrieder, Karl.vonEllenrieder@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/37038
Assistente	
Semestre	Primo semestre
Anno/i di corso	1
CFU	5
Ore didattica frontale	28
Ore di laboratorio	18
Ore di studio individuale	79
Ore di ricevimento previste	15
Sintesi contenuti	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.
Argomenti dell'insegnamento	The basic principles of stability and automatic control for linear time-invariant systems are presented.

Parole chiave	Automatic Control, Stability, Linear Time-Invariant Systems
Prerequisiti	None.
Insegnamenti propedeutici	
Modalità di insegnamento	Classroom lectures and exercises.
Obbligo di frequenza	Attendance at lectures is strongly recommended. Attendance at exercise sessions is required.
Obiettivi formativi specifici e risultati di apprendimento attesi	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.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	

Modalità di esame	- 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.
Criteri di valutazione	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.
Bibliografia obbligatoria	Lecture notes and exercises will be available on the UniBZ Open Learning Environment (OLE).
Bibliografia facoltativa	Additional books and articles may be recommended by the instructor during the course.
Altre informazioni	
Obiettivi di Sviluppo Sostenibile (SDGs)	Istruzione di qualità