Syllabus

Descrizione corso

Titolo insegnamento	Fondamenti di Automatica
Codice insegnamento	42411
Titolo aggiuntivo	
Settore Scientifico-Disciplinare	IINF-04/A
Lingua	Inglese
Corso di Studio	Corso di laurea in Ingegneria Elettronica e dei Sistemi ciberfisici
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	2
CFU	6
Ore didattica frontale	36
Ore di laboratorio	0
Ore di studio individuale	114
Ore di ricevimento previste	12
Sintesi contenuti	The course covers the following topics: 1. Introduction a. Time response of 1st/2nd order systems b. Block diagrams c. Linear stability d. Effects of feedback 2. Classical Control a. root locus – fundamental ideas b. frequency methods – fundamental ideas and design approach 3. Basics of Digital Control (time-permitting)

Argomenti dell'insegnamento	The basic principles of dynamics systems modelling, stability and automatic control for linear time-invariant systems are presented.
Parole chiave	Dynamic modelling, linear time-invariant systems, automatic control
Prerequisiti	Mathematical Analysis I and II; Physics I and II; Basics of Electronics; Fundamentals of Programming (Module 1)
Insegnamenti propedeutici	
Modalità di insegnamento	Classroom lectures and in-class exercises
Obbligo di frequenza	Attendance at lectures and exercises is strongly recommended. Attendance at examinations is required
Obiettivi formativi specifici e risultati di apprendimento attesi	The course belongs to the type "caratterizzanti - ingegneria elettronica".The course introduces the fundamentals of linear control theory. Topics covered include: The dynamic response of 1st and 2nd order systems; linear stability; root locus stability analysis; control design and stability analysis in the frequency domain; and time-permitting, basics of digital control systems. The course is aimed at 1st/2nd year undergraduate level students and focuses on building understanding and intuition. Examples and exercises that use Matlab and Simulink will be given.
Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)	
Modalità di esame	Formative assessment Form: Exercises Length /duration: 24 hours total Summative assessment Form : Exercises (30%) and Final Exam (70%) Length/duration: 4 hours
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 (final mark of 18/30) to pass the course.

Bibliografia obbligatoria	Lecture notes and exercises will be available on Teams.
Bibliografia facoltativa	Additional books and articles may be recommended by the instructor during the course
Altre informazioni	Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it Software used : Matlab and Simulink.
Obiettivi di Sviluppo Sostenibile (SDGs)	Istruzione di qualità