Syllabus

Course Description

Course Title	Fundamentals of Systems and Control
Course Code	42411
Course Title Additional	
Scientific-Disciplinary Sector	IINF-04/A
Language	English
Degree Course	Bachelor in Electronics and Cyber-Physical Systems 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	2
CP	6
Teaching Hours	36
Lab Hours	0
Individual Study Hours	114
Planned Office Hours	12
Contents Summary	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)

Course Topics	The basic principles of dynamics systems modelling, stability and automatic control for linear time-invariant systems are presented.
Keywords	Dynamic modelling, linear time-invariant systems, automatic control
Recommended Prerequisites	Mathematical Analysis I and II; Physics I and II; Basics of Electronics; Fundamentals of Programming (Module 1)
Propaedeutic Courses	
Teaching Format	Classroom lectures and in-class exercises
Mandatory Attendance	Attendance at lectures and exercises is strongly recommended. Attendance at examinations is required
Specific Educational Objectives and Learning Outcomes	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.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Formative assessment Form: Exercises Length /duration: 24 hours total Summative assessment Form : Exercises (30%) and Final Exam (70%) Length/duration: 4 hours
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 (final mark of 18/30) to pass the course.

Required Readings	Lecture notes and exercises will be available on Teams.
Supplementary Readings	Additional books and articles may be recommended by the instructor during the course
Further Information	Subject Librarian: David Gebhardi, David.Gebhardi@unibz.it and Ilaria Miceli, Ilaria.Miceli@unibz.it Software used : Matlab and Simulink.
Sustainable Development Goals (SDGs)	Quality education