

# Syllabus

## *Descrizione corso*

<b>Titolo insegnamento</b>	Fondamenti di Automatica
<b>Codice insegnamento</b>	42411
<b>Titolo aggiuntivo</b>	
<b>Settore Scientifico-Disciplinare</b>	IINF-04/A
<b>Lingua</b>	Inglese
<b>Corso di Studio</b>	Corso di laurea in Ingegneria Elettronica e dei Sistemi ciberfisici
<b>Altri Corsi di Studio (mutuati)</b>	
<b>Docenti</b>	prof. Karl Dietrich von Ellenrieder, Karl.vonEllenrieder@unibz.it <a href="https://www.unibz.it/en/faculties/engineering/academic-staff/person/37038">https://www.unibz.it/en/faculties/engineering/academic-staff/person/37038</a>
<b>Assistente</b>	
<b>Semestre</b>	Primo semestre
<b>Anno/i di corso</b>	2
<b>CFU</b>	6
<b>Ore didattica frontale</b>	36
<b>Ore di laboratorio</b>	0
<b>Ore di studio individuale</b>	114
<b>Ore di ricevimento previste</b>	12
<b>Sintesi contenuti</b>	<p>The course covers the following topics:</p> <ol style="list-style-type: none"><li>1. Introduction<ol style="list-style-type: none"><li>a. Time response of 1st/2nd order systems</li><li>b. Block diagrams</li><li>c. Linear stability</li><li>d. Effects of feedback</li></ol></li><li>2. Classical Control<ol style="list-style-type: none"><li>a. root locus – fundamental ideas</li><li>b. frequency methods – fundamental ideas and design approach</li></ol></li><li>3. Basics of Digital Control (time-permitting)</li></ol>

<b>Argomenti dell'insegnamento</b>	The basic principles of dynamics systems modelling, stability and automatic control for linear time-invariant systems are presented.
<b>Parole chiave</b>	Dynamic modelling, linear time-invariant systems, automatic control
<b>Prerequisiti</b>	Mathematical Analysis I and II; Physics I and II; Basics of Electronics; Fundamentals of Programming (Module 1)
<b>Insegnamenti propedeutici</b>	
<b>Modalità di insegnamento</b>	Classroom lectures and in-class exercises
<b>Obbligo di frequenza</b>	Attendance at lectures and exercises is strongly recommended. Attendance at examinations is required
<b>Obiettivi formativi specifici e risultati di apprendimento attesi</b>	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.
<b>Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)</b>	
<b>Modalità di esame</b>	Formative assessment Form: Exercises Length /duration: 24 hours total Summative assessment Form : Exercises (30%) and Final Exam (70%) Length/duration: 4 hours
<b>Criteri di valutazione</b>	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.

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