

AUTOMATION_S5 Fall Semester Undergraduate/Junior	Control Engineering & Energy I	5 credits Lab: 40% Final exam (3h): 60%
<p>This course aims at explaining the fundamental notions used to study linear systems and to introduce alternating energy production. The study of linear systems relies on prior knowledge and recalls basic notions applied for single-variable reduced order systems. The study of electrical systems in steady state allows the definition of the alternating current electrical machines principles, alternator, induction motor, while explaining the different types of power plants used in energy production.</p>		
Prerequisite: None		

DA_1401	Linear Systems	Language ■ ■
Lecture: 12	Tutorials: 10	Lab work: 12
<p>This course deals with the application of linear systems theory to engineering. It recalls the basic knowledge of single-input-single-output (SISO) continuous-time linear systems, open-loop and closed-loop (feedback) control.</p> <ul style="list-style-type: none"> - Laplace and Fourier Transforms - Continuous-time linear systems - Transfer function and diagrams (Bode, Nyquist, Black-Nichols) - Order 1 and 2 systems - Identification - Stability, precision, speed - PID (Proportional-integral-derivative) controllers 		

DA_1402	Alternating energy production	Language ■ ■
Lecture: 12	Tutorials: 12	Lab work: 12
<p>This course deals with the basic knowledge in alternating electrical energy production and transport. General principles of alternating machines are given: alternator, induction motor.</p> <ul style="list-style-type: none"> - Ferromagnetism - Steady state electrokinetics - Polyphase electrical systems - Forced flux machine model, transformer - Electrical energy production, alternators - Induction motor - Electrical safety rules - Power plants 		