



Analog Electronics II (14042)		
<b>BACHELOR IN INDUSTRIAL ELECTRONICS AND AUTOMATION</b>	<b>2020-2021 – 4th course</b>	<b>TERM: 1st</b>

*There are 28 lectures along 14 weeks. Laboratories are remarked by blue, the color of the box if it is a session, the color of the text if the activity is related with it. Lab is developed around the Projects to be designed and implemented by the students. Projects score a 60% of the final mark. You will use every lab session to develop them.*

Weekly planning									
WEEK	SESSION	CONTENT OF THE SESSION	GROUP		Other kind of classrooms	Session with 2 teachers	Weekly student work		
			LECTURE	SEMINAR			DESCRIPTION	HOURS IN CLASS	WORKING HOURS (<7 PER WEEK)
1	1	Introduction. Feedback configurations review	ONLINE			NO	Analog Electronics 1 review.	1,66	3
1	2	A network with load effects. Frequency response.		X		NO	Problems resolution.	1,66	8
2	3	Frequency response: Stability, concept and Nyquist plots.	ONLINE			NO	Stability concept work out. Nyquist plot review.	1,66	
2	4	Compensation: concept and methods.		X		NO	Working out the example before the lecture. <a href="#">Assignments of Projects to students.</a>	1,66	8
3	5	Stable and unstable systems	ONLINE		SIMULATION	NO	Analyzing compensation in electronics.	1,66	

3	6	Compensation: actual circuit applications. Examples of techniques		X		NO	Problems resolution.	1,66	
4	7	Compensation problem.	ONLINE		SIMULATION	NO	<i>Working out the example before the lecture.</i>	1,66	8
4	8	Finishing compensation examples. FLIPPED CLASSROOM Oscillators: concept and Barkhausen criteria. Types.		X		NO	WATCHING THE VIDEOS Oscillator types: studying examples and solving problems.	1,66	8
5	9	Oscillator problems. Crystal oscillator.	ONLINE			NO	Oscillator types: studying examples and solving problems.	1,66	
6	10	<a href="#">Students presentation of the selected Projects</a> More oscillator circuits	ONLINE			YES	<a href="#">Preparing the presentation.</a>	1,66	7
6	11	<b>Partial examination: stability and compensation.</b>		X		NO	Problems resolution.	1,66	
7	12	FLIPPED CLASSROOM Real effects of Op Amps. Comparators. Schmitt trigger and applications.	ONLINE			NO	WATCHING THE VIDEOS Problems resolution. Web search of datasheet examples. Studying references to get the idea. <a href="#">Project subsystem simulations.</a> <a href="#">Searching for the Project's electronic components</a>	1,66	8
7	13	<i>Oscillator and opamp applications</i>		X		NO	<i>Working out the example before the lecture.</i>	1,66	
8	14	<b>Nonlinear oscillators. Timers.</b>	ONLINE		SIMULATION	NO	Problems resolution. <a href="#">Project subsystem simulations.</a>	1,66	6
8	15 LAB	Subsystems setups (I)		X	Lab	YES	Subsystems set-up: starting	2,5	
9	16	More problems on nonlinear amplifiers. PID control using opamps.	ONLINE			NO	Web search of other circuits, such as precision rectifiers, DDS, etc.	1,66	5
9	17 LAB	Subsystems setups (II)		X	Lab	YES	Subsystems set-up	2,5	
10	18	Fully differential amplifiers. Active filters design overview.	ONLINE			NO	Studying the subject.	1,66	5
10	19 LAB	Subsystems setups (III)		X	Lab	YES	Subsystems operation: first trials.	2,5	

11	20	Specific purpose Integrated circuits. PLLs, DDS...	ONLINE			NO	Docs to be used	1,66	4
11	21 LAB	Subsystems setups (IV)		X	Lab	YES	Verifying operation.	2,5	
12	22	Review problems (I): stability and compensation.	ONLINE			NO	Similar problems resolution	1,66	4
12	23 LAB	Assembling parts		X	Lab	YES	Assembling subsystems and detecting malfunctions.	2,5	
13	24	Review problems (II): oscillators.	ONLINE			NO	Similar problems resolution	1,66	4
13	25 LAB	Projects tune-up		X	Lab	YES	Fixing errors, final tune-up	2,5	
14	26	Review problems (III): nonlinear amplifiers.	ONLINE				Similar problems resolution	1,66	5,48
14	27	Projects presentations.		X		YES		1,66	
14	28 Same day	Second shift of Project presentations.		X		YES	Only if necessary		
<b>Subtotal 1</b>								<b>51,52</b>	<b>88,48</b>
<b>Total 1 (Face-to-face and distance working hours during weeks # 1-14)</b>								<b>140</b>	
15		Tutorials, submissions, etc.						15	
16		Examinations and their preparation						3	22
17									
18			X						
<b>Subtotal 2</b>								<b>3</b>	<b>37</b>
<b>Total 2 Face-to-face and distance working hours during weeks #15-18)</b>								<b>40</b>	
<b>TOTAL (Total 1 + Total 2. 180 hours max.)</b>								<b>180</b>	