Universidad Carlos III de Madrid
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COURSE: CALCULUS I

DEGREE: Bachelor of Industrial Electronics and Automation/Mechanical Engineering | **YEAR: 2015/2016** | **TERM: Fall**

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	GROUPS (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	Indicate YES/NO If the session needs 2 teachers	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	**The real line, intervals, inequalities, absolute value, sets in the real line and in the plane, mathematical induction.**	X			NO	Review of notions studied in previous years. Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	4
1	2	Solve exercises related to the contents in session 1.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
2	3	**Sequences of numbers, main notions, limits of sequences, recurrent sequences. Stirling formula and Stoltz test.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	6
2	4	Solve exercises related to the contents in session 3.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
3	5	**Series of numbers, main notions. Tests for convergence for series of positive numbers, absolute and conditional convergence. Leibniz's test.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7
3	6	**Elementary functions, composition of functions, inverse function. Polar coordinates and sketch of graphs of functions.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	
3	7	Solve exercises related to the contents in session 5.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	

4	8	**Limits of functions, definition, main theorems. Evaluation of limits.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7
4	9	Solve exercises related to the contents in session 6.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
5	10	**Continuous functions, properties and main theorems.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	5
5	11	Solve exercises related to the contents in session 8.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
6	12	**Differentiation of functions: definition, differentiation rules, interpretation. Bernoulli-L'Hôpital rule.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7
6	13	Solve exercises related to the contents in session 10.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
7	14	**Main theorems on differentiation. Extrema of functions. Optimization problems with constraints.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7
7	15	Solve exercises related to the contents in session 12.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
8	16	**Convexity and asymptotes. Graph of functions.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	5
8	17	Solve exercises related to the contents in session 14. **QUIZ 1.**		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
9	18	**Taylor polynomial and series: definition, main theorems. Evalution of limits with Taylor polynomial. Convergence domain for a Taylor series.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	6
9	19	Solve exercises related to the contents in session 16.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
10	20	**Antiderivatives, integration rules, integration by parts and by decomposition in simple fractions.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7
10	21	Solve exercises related to the contents in session 18.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
11	22	**Integration by substitution and other methods to evaluate integrals.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7

11	23	Solve exercises related to the contents in session 20.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
12	24	**Definite integral and the fundamental theorem of calculus.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	4,67
12	25	Solve exercises related to the contents in sessions 20, 22.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
13	26	**Applications of integration: areas, volumes and length.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7
13	27	Solve exercises related to the contents in sessions 24, 26. **QUIZ 2.**		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
14	28	**Physical applications of the definite integral.**	X			NO	Study the contents explained in the lectures from the main references. Solve problems described in the lectures.	1,6	7
14	29	Solve exercises related to the contents in sessions 26, 28.		X		NO	Solve exercises in the homework sheet related to the session.	1,6	
							Subtotal 1	**48,33**	**86,67**
		Total 1 *(Hours of class plus student homework hours between weeks 1-14)*						135	
15		Tutorials, handing in, etc	X			NO		2	
16		Assessment						3	20
17									
18									
							Subtotal 2	**5**	**20**
		Total 2 *(Hours of class plus student homework hours between weeks 15-18)*						25	
TOTAL *(Total 1 + Total 2. Maximum 180 hours)*								**160**	