Universidad Carlos III de Madrid
www.uc3m.es

COURSE: CALCULUS I		
DEGREE: AEROSPACE ENGINEERING	YEAR: FIRST	TERM: FIRST

La asignatura tiene 29 sesiones que se distribuyen a lo largo de 14 semanas. Los laboratorios pueden situarse en cualquiera de ellas. Semanalmente el alumnos tendrá dos sesiones, excepto en un caso que serán tres

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	HOME HOU (Max wee
1	1	Introduction.		x		No	Conjectures, theorems, proofs.	1,6	4.
2	2	Real numbers.	x			No	Properties of real numbers. Intervals, inequalities, absolute value.	1,6	
2	3	Intervals and inequalities. Absolute values.		x		No	Problems and exercises corresponding to session #2.	1,6	4.
3	4	Functions. Domain and range. Combining and composing functions. Reflections, stretches and compressions. Inverse functions.	x			No	Concepts and properties of functions. New functions from old.	1,6	
3	5	Problems.		x		No	Problems and exercises corresponding to session #4.	1,6	4.
4	6	Trigonometric functions, exponential functions,	x			No	Elementary functions.	1,6	

		logarithmic functions.							
4	7	Problems.		x		No	Problems and exercises corresponding to session #6.	1,6	4.
5	8	Limits of functions.	x			No	Concepts and properties of limits.	1,6	
5	9	Problems.		x		No	Problems and exercises corresponding to session #8.	1,6	4.
6	10	Continuity. Differentiability.	x			No	Continuity. Properties. Intermediate value Theorem. Differentiability. Chain rule.	1,6	
6	11	Problems.		x		No	Problems and exercises corresponding to session #10.	1,6	4.
7	12	Finding roots. The bisection and Newton's method.	x			No	Concepts of iteration and convergence.	1,6	
7	13	Problems.		x		No	Problems and exercises corresponding to session #12.	1,6	4.
8	14	Maclaurin and Taylor polynomials.	x			No	Local approximation of a function.	1,6	
8	15	Problems.		x		No	Problems and exercises corresponding to session #14.	1,6	4.
9	16	Series. Convergence criteria. Taylor series.	x			No	Series. Radius of convergence. Convergence criteria. Taylor series. Limits.	1.6	
9	17	Problems		x		No	Problems and exercises corresponding to session #16.	1.6	
10	18	Control.	x			No	Control.	1,6	
10	19	Problems.		x		No	Review of exam and series.	1,6	4.
11	20	Area problem. Antiderivatives. Riemann sums. Definite integral. Fundamental Theorem of Calculus.	x			No	Concepts and properties of integration.	1,6	
11	21	Problems.		x		No	Problems and exercises corresponding to session #20.	1,6	4.
12	22	Principles of integral evaluation. Integration by parts. Integration by change of variables. Rational functions.	x			No	Methods to compute antiderivatives.	1,6	
12	23	Problems.		x		No	Problems and exercises corresponding to session #22.	1,6	4.
13	24	Definite integrals. Applications of the definite integral: length, area, volume.	x			No	Applications of integral calculus.	1,6	
13	25	Problems.		x		No	Problems and exercises corresponding to session #24.	1,6	2.4
14	26	Ordinary Differential Equations (ODEs).	x			No	Modeling with differential equations. Separation of variables.	1,6	

14	27	Problems.		x		No	Problems and exercises corresponding to session #26.	1,6	2.4
15	28	Techniques to solve ODEs.	x			No	Solution of linear, homogeneous ODEs. Euler's method.	1,6	2.4
15	29	Problems.		x			Problems and exercises corresponding to session #28.	1,6	2.4
							Subtotal 1	**48,33**	**7**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	119.3	

16		Tutorials, handing in, etc						7	
16		Assessment						3	2(
							Subtotal 2	**3**	**2(**
							Total 2 *(Hours of class plus student homework hours between weeks 15-18)*	149.3	

TOTAL *(Total 1 + Total 2. Maximum 180 hours)*	