![uc3m | Universidad Carlos III de Madrid | Departamento de Matemáticas]

TITLE OF COURSE: Calculus I		
DEGREE: Bachelor's Degree in Industrial Technologies Engineering **(256)**	**COURSE: 2024/2025**	**QUARTER: First**

WEEKLY PLANNING OF THE COURSE								
WEEK	SESSION	DESCRIPTION OF THE CONTENT OF THE SESSION	GROUP (tick X)		Indicate space other than classroom	Indicate YES/NO if it is a session with 2 teachers.	STUDENT'S WEEKLY WORK		
			BIG	SMALL			DESCRIPTION	HOURS PRESEN-CIALES	WORKING HOURS (Max. 7h per week)
1	1	**The real line, sets of numbers, inequalities, absolute value, intervals and sets in the plane. Principle of mathematical induction.**	X			NO	Review of related contents studied in the previous level. Study of the contents covered in the basic bibliography. Problem solving guided in master classes.	1,66	4
1	2	Solving problems related to the contents covered in session 1.		X		NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
2	3	**Number sequences and fundamental concepts. Recurrent sequences. Limits of sequences, Stirling's Formula and Stoltz Criterion.**	X			NO	Study of the contents covered in the basic bibliography. Problem solving guided in master classes.	1,66	6
2	4	Solving problems related to the contents covered in session 3.		X		NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
3	5	**Series of numbers, fundamental concepts. Convergence criteria for series of positive numbers, absolute convergence, conditional convergence and Leibniz criterion.**	X			NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
3	6	**Elementary functions, elementary transformations, composition of functions and inverse function. Polar coordinates.**	X			NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	
3	7	Solving problems related to the contents covered in session 5.		X		NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	

4	8	**Limits of functions, definition and fundamental theorems. Calculation of limits.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
4	9	Solving problems related to the contents covered in session 6.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
5	10	**Continuity of functions, properties and fundamental theorems.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	5
5	11	Solving problems related to the contents covered in session 8.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
6	12	**Derivation of functions. definitions, rules of derivation, derivatives of elementary functions, meaning of the derivative. Bernoulli-L'Hôpital rule.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
6	13	Solving problems related to the contents covered in session 10.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
7	14	**Basic theorems on derivation. Optimisation problems of functions of two variables subject to a condition.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
7	15	Solving problems related to the contents covered in session 12.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
8	16	**Convexity and asymptotes. Graphs of functions.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	5
8	17	**Resolution** of problems related to the contents dealt with in session 14.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
9	18	**Polynomial and Taylor series, definition, properties and examples. Calculation of limits with the Taylor polynomial. Interval of convergence of a Taylor series.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	6
9	19	Solving problems related to the contents covered in session 16.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
10	20	**Calculation of primitives: immediate integrals, integration by parts and by decomposition into simple fractions.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
10	21	Solving problems related to the contents covered in session 18.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
11	22	**Calculation of primitives: change of variable and other methods of integration.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
11	23	Solving problems related to the contents covered in session 20.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
12	24	**Definite integral and fundamental theorems of calculus.**	X				NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	4,67
12	25	Solving problems related to the contents dealt with in sessions 20 and 22.		X			NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	

13	26	**Geometric applications of the definite integral.**	X			NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
13	27	Resolution of problems related to the contents dealt with in sessions 24 and 26.		X		NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	
14	28	**Physical applications of the definite integral.**	X			NO	Study of the contents covered in the basic bibliography. Problem solving in master classes.	1,66	7
14	29	Solving problems related to the contents dealt with in sessions 26 and 28.		X		NO	Resolution of the exercises related to the session that appear in the problem bank of the course.	1,66	

Subtotal 1	48,33	86,67
Total 1 *(Classroom and student work hours between weeks 1-14)*	**135**	

15		Recovery, tutorials, delivery of work, etc	X			NO	Tutorials	2
16								
17		Preparation for evaluation and assessment						3	20
18								

Subtotal 2	5	
Total 2 *(Face-to-face and working hours between weeks 15-18)*	**25**	
TOTAL *(Total 1 + Total 2. Maximum 180 hours)*	**160**	