Universidad Carlos III de Madrid
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COURSE: CALCULUS II		
DEGREE: AEROSPACE ENGINEERING	**COURSE: 2021-2022**	**TERM: SECOND**

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 31/1	1	Introduction to the course. Euclidean space. Three-Dimensional Coordinate Systems. Cross and Scalar Product. Cylinders and Quadric Surfaces.	X			No	- Sections 12.1, 12,3,12.4 and 12.6 of [S]. - Sections 1.2, 1.3, 1.5 [MT].	1,66	6
1	2	Exercises Assignment 1		X		No	- Exercises Assignment 1	1,66	
2 7/2	3	Topology of $\mathbb{R}^n$. Polar Coordinates. Cylindrical and Spherical Coordinates. Curves in $\mathbb{R}^3$. Graphic of scalar functions.	X			No	- Sections 10.4, 12.7, 13.1 and 14.1 of [S] - Sections 1.5, 1.4 and 2.1 of [MT].	1,66	6
2	4	Exercises Assignment 2		X		No	- Exercises Assignment 2	1,66	
3 14/2	5	Concept of limit and properties. Computing limits Continuity	X			No	- Section 14.2 of [S]. - Section 2.2 of [MT].	1,66	6
3	6	Exercises Assignment 3		X		No	- Exercises Assignment 3	1,66	
4 14/2	7	Partial derivatives. Equation of the Tangent Plane Directional Derivative and Gradient Vector.	X			No	- Sections 14.3, 14.4 and 14.6 of [S]. - Sections 2.3 and 2.5 of [MT].	1,66	6

4	8	Exercises Assignment 3		X		No	- Exercises Assignment 3	1,66	
5 21/2	9	Differentiation of vector valued functions. Jacobian matrix and determinant. Differentiability. Properties of the derivative. Chain Rule.	X			No	- Section 14.4 and 14.5 of [S]. Section 2.5 and 2.6 of [MT].	1,66	6
5	10	Exercises Assignment 4		X		No	- Exercises Assignment 4	1,66	
6 28/2	11	Higher order derivatives. Differential operators. Curl and Divergence. Taylor Polynomial. Hessian Matrix.	X			No	- Sections 14.3 and 16.5 of [S]. - Sections 3.1, 3.2 and 4.4 of [MT].	1,66	6
6	12	Exercises Assignment 5		X		No	- Exercises Assignment 5	1,66	
7 7/3	13	Critical points. Maximum and Minimum Values. Lagrange Multipliers.	X			No	- Sections 14.7 and 14.8 of [S]. - Sections 3.3 and 3.4 of [MT].	1,66	6
7	14	Exercises Assignment 6		X		No	- Exercises Assignment 6	1,66	
8 14/3	15	Optimization	X			No	- Sections 14.8 of [S]. Sections 3.4 of [MT].	0,83	6
8 14/3	15	First Control.			Magistral Class	Yes		0,83	
8	17	Exercises Assignment 7		X		No	- Exercises Assignment 7	1,66	
9 21/3	18	Integration of 2-variables Functions. Fubini's Theorem. Changing the Integration Order. Applications.	X			No	- Sections 15.1, 15.2, 15.3 and 15.5 of [S]. Sections 5.1, 5.2, 5.3 and 5.4 of [MT].	1,66	6
9	19	Exercises Assignment 8		X		No	- Exercises Assignment 8	1,66	
10 28/3	20	Integration of 3-variables Functions. Change of variables. Applications.	X			No	- Sections 15.7, 15.4, 15.8, and 15.9 of [S]. - Sections 6.1, 6.2 and 6.3 of [MT].	1,66	6
10	21	Exercises Assignment 9		X		No	- Exercises Assignment 9	1,66	
11 4/4	23	Curves in the n-dimensional Euclidean Space. Line Integral Conservative Fields and Potential Function	X			No	- Sections 13.1, 16,1, 16.2 and 16.3 of [S]. - Sections 7.1 and 7.2 of [MT].	1,66	6
11	24	Exercises Assignment 10		X		No	- Exercises Assignment 10	1,66	
12 4/4	25	Parametrized Surfaces. Surface integrals. Area of a Surface. Integrals of Scalar Functions and Vector Fields.	X			No	- Sections 16.6 and 16.7 of [S]. - Sections 7.3, 7.4, 7.5 and 7.6 of [MT].	1,66	6
12	26	Exercises Assignment 11		X		No	- Exercises Assignment 11	1,66	
13 25/4	27	Second Control			Magistral Class	Yes		1,66	6
13	28	Exercises Assignment 11		X		No	- Exercises Assignment 11	1,66	
14	29	Green Theorem, Stokes Theorem and Gauss Theorem.	X			No	- Sections 16.4, 16.8 and 16.9 of [S]. - Sections 8.1, 8.2 and 8. of [MT].	1,66	

9/5									6
14	30	- Exercises Assignment 12		X		No	- Exercises Assignment 12	1,66	
							Subtotal 1	**49,8**	**84**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	133,8	
15		Tutorials, handing in, etc.							
16		Assessment						3	13,2
17									
18									
							Subtotal 2	**3**	**13,2**
							Total 2 *(Hours of class plus student homework hours between weeks 15-18)*	16,2	
TOTAL *(Total 1 + Total 2. Maximum 180 hours)*								**150**	

[S] Stewart. (2016). *Multivariable calculus* (8th ed.). Cengage Learning.

[MT]Marsden, & Tromba, A. J. (2013). *Vector calculus* (6th ed., International ed.): W.H. Freeman.