Universidad Carlos III de Madrid
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COURSE: Calculus I		
DEGREE: Bachelor in Engineering	YEAR: 1st	TERM: 1st

29 *(*4, see Notes at the end)* *sessions along 14 weeks.*

WEEKLY PLANNING									
			GROUPS				**WEEKLY PROGRAMMING FOR STUDENTS**		
WEEK	SESSION	DESCRIPTION	LECTURES	SEMINARS	#1	#2	DESCRIPTION	CLASS HOURS (*5, see Notes at the end)	HOMEWORK HOURS (Max. 7h week)
1	1	**PRESENTATION** **CHAPTER 1: Functions of real numbers and Limits** (0*, all chapters and section numbers refer to the book by Larson&Edwards) - P.3 Functions and their graphs - 1.1 A preview of Calculus - 1.2 Finding limits graphically and numerically	X				(*1, see Notes at the end)	1,66	7
1	2	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
2	3	- 1.3 Evaluating limits analytically - 1.4 Continuity and One-sided limits - 1.5 Infinite limits	X				(*1, see Notes at the end)	1,66	7
2	4	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
3	5	**CHAPTER 2: Differentiation** - 2.1 The derivative and the tangent line - 2.2 Basic differentiation rules and rates of change	X				(*1, see Notes at the end)	1,66	7

		- 2.3 Product and quotient rules and higher-order derivatives - 2.4 The chain rule - 2.5 Implicit differentiation								
3	29 (*4)	**CHAPTER 3: Applications of differentiation** - 3.1 Extrema on an interval - 3.2 Rolle's and mean-value theorems - 3.3 Increasing and decreasing functions - 3.4 Concavity	X				(*1, see Notes at the end)	1,66	7
3	6	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
4	7	- 3.5 Limits at Infinity - 3.6 Curve sketching - 3.7 Optimization problems	X				(*1, see Notes at the end)	1,66	7
4	8	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
5	9	- 9.7 Taylor polynomials and approximations - 8.7 Indeterminate forms and L'Hôpital's rule	X				(*1, see Notes at the end)	1,66	7
5	10	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
6	11	**CHAPTER 4: Integration** - 4.1 Antiderivatives and indefinite integration - 4.2 Area - 4.3 Riemann sums and definite integrals - 4.4 The Fundamental Theorem of Calculus	X				(*1, see Notes at the end)	1,66	7
6	12	**Test on Chapters 1, 2 and 3** Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
7	13	**CHAPTER 8: Integration techniques, L'Hôpital's rule, and improper integrals** - 8.1 Basic integration rules - 4.5 Integration by substitution - 8.2 Integration by parts - 8.3 Trigonometric integrals - 8.4 Trigonometric substitution - 8.5 Partial fractions	X				(*1, see Notes at the end)	1,66	7

				X						
		- 8.8 Improper integrals								
7	14	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
8	15	**CHAPTER 5: Logarithmic, exponential and other transcendental functions** - 5.1 The natural logarithmic function: Differentiation - 5.2 The natural logarithmic function: Integration - 5.3 Inverse functions - 5.4 Exponential functions: Differentiation and integration - 5.5 Bases other than e and applications - 5.6 Inverse trigonometric functions: Differentiation - 5.7 Inverse trigonometric functions: Integration - 5.8 Hyperbolic functions	X				(*1, see Notes at the end)	1,66	7
8	16	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
9	17	**CHAPTER 7: Applications of Integration** - 7.1 Area of a region between two curves - 7.2 Volume: The disk method - 7.3 Volume: The shell method	X				(*1, see Notes at the end)	1,66	7
9	18	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
10	19	- 7.4 Arc length and surfaces of revolution - 7.5 Work - 7.6 Moments, centers of mass and centroids - 7.7 Fluid pressure and fluid force	X				(*1, see Notes at the end)	1,66	7
10	20	**Test on Chapters 4, 8 and 5** Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
11	21	**CHAPTER 9: Infinite series** - 9.1 Sequences - 9.2 Series and convergence	X				(*1, see Notes at the end)	1,66	7
11	22	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
12	23	- 9.3 The integral test and p-series - 9.4 Comparison of series - 9.5 Alternating series - 9.6 The ratio and root tests	X				(*1, see Notes at the end)	1,66	7
12	24	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	

13	25	- 9.8 Power series - 9.9 Representation of functions by power series	X				(*1, see Notes at the end)	1,66	7
13	26	Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
14	27	- 9.10 Taylor and Maclaurin series	X				(*1, see Notes at the end)	1,66	7
14	28	**Test on Chapter 9 (optional)** Selected exercises (*2, see Notes at the end)		X			Odd numbered exercises. Compare with solutions (*3)	1,66	
						Subtotal 1		48,33	98

		Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	**146,33**

15		Extra sessions Tutorials, handling in, etc							4
16		Assessment, evaluation preparation						3,66	6
17		Final Test							
18									
						Subtotal 2		3,66	10

		Total 2 *(Hours of class plus student homework hours between weeks 15-18)*	

TOTAL *(Total 1 + Total 2)*	**160**

Notes:

(*0) All chapters and sections numbers refer to the textbook by Larson&Edwards "Calculus I (single variable)" ed. Cengage Learning (9th edition).

(*1) Study the corresponding sessions in Larson&Edwards' book.

(*2) Selected exercises from Larson&Edwards' book corresponding to the previous lecture in large group.

(*3) Do some of the odd numbered exercises Larson&Edwards' book corresponding to the previous lecture in large group and compare with the solutions in the book.

(*4) There are 29 sessions. 15 of theory, 14 of exercises. The extra theory session occurs (due to the university schedules) on week 3.

(*5) 1,66 hours (in fact 10/6) corresponds to 100 minutes each session.

#1 SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)
#2 Indicate YES/NO If the session needs 2 teachers