



COURSE: CALCULUS I

DEGREE: BACHELOR IN MECHANICAL ENGINEERING

YEAR: FIRST

TERM: FIRST

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	Presentation of the subject Theory Unit 1: Real numbers	X			No	- Presentation of the subject - Proofs: Induction P. - The real line - Intervals, inequalities, absolute value	2,5	5
1	2	Presentation Exercises Unit 1		X		No	- Presentation of the problem classes - Exercises Unit 1	2,5	
2	3	Theory Unit 2: Sequences of Real numbers	X			No	- Definition and properties of sequences - Limits of sequences	2,5	5
2	4	Exercises Unit 2		X		No	- Exercises Unit 2	2,5	
3	5	Theory Unit 3: Series of Real numbers	X			No	- Definition and characterization of series - Convergence criteria - Techniques for evaluating sum of series	2,5	5
3	6	Exercises Unit 3		X		No	- Exercises Unit 3	2,5	

4	7	Theory Unit 4: Function of Real Variable	X			No	- Definition and characterization of function - Elementary functions	2,5	5
4	8	Exercises Unit 4		X		No	- Exercises Unit 4	2,5	
5	9	Theory Unit 5: Limits of Functions	X			No	- Definition and properties of limits of functions - Basic techniques to calculate limits - Indeterminations and equivalent infinitesimal	2,5	5
5	10	Exercises Unit 5		X		No	- Exercises Unit 5	2,5	
6	11	Theory Unit 6: Continuous Functions	X			No	- Definition and properties of continuous functions - Bolzano's theorem	2,5	5
6	12	Exercises Unit 6		X		No	- Exercises Unit 6	2,5	
7	13	Review	X			No	- Review of the first part of the program	2,5	5
7	14	Assessment Test 1		X		No	- Assessment Test 1	2,5	
8	15	Theory Unit 7: Differentiation	X			No	- Definition and properties of differentiation of functions - Mean value theorem - Rules of differentiation	2,5	5
8	16	Exercises Unit 7		X		No	- Exercises Unit 7	2,5	
9	17	Theory Unit 8: Taylor Polynomial	X			No	- Definition and properties of the Taylor polynomial - Rest of Taylor - Taylor polynomial calculation	2,5	5
9	18	Exercises Unit 8		X		No	- Exercises Unit 8	2,5	
10	19	Theory Unit 9: Applications of differential calculus	X			No	- Local study of functions - Convexity and asymptotes - Global study of functions - Optimization	2,5	5
10	20	Exercises Unit 9		X		No	- Exercises Unit 9	2,5	
11	21	Theory Unit 10: Integral Calculus	X			No	- Definition of Integral. Riemann sums - Geometric interpretation of the integral - Fundamental Theorem of Integral Calculus - Barrow's Rule	2,5	5
11	22	Exercises Unit 10		X		No	- Exercises Unit 10	2,5	
12	23	Theory Unit 11: Techniques to Calculate Primitives	X			No	- Elementary techniques for calculating integrals - Substitution method, by parts and change of variable - Rational integrals	2,5	5
12	24	Exercises Unit 11		X		No	- Exercises Unit 11	2,5	

13	25	Theory Unit 12: Applications of the Integration	X			No	- Calculation of areas of plane figure - Volumes of revolution - Lengths of curves	2,5	5
13	26	Exercises Unit 12		X		No	- Exercises Unit 12	2,5	
14	27	Review	X			No	- Review of the second part of the program	2,5	5
14	28	Assessment Test 2		X		No	- Assessment Test 2	2,5	
Subtotal 1								70	70
Total 1 (<i>Hours of class plus student homework hours between weeks 1-14</i>)								140	
15		Tutorials, handing in, etc.						5	5
16		Assessment						5	5
17									
18									
Subtotal 2								10	10
Total 2 (<i>Hours of class plus student homework hours between weeks 15-18</i>)								20	
TOTAL (<i>Total 1 + Total 2. Maximum 180 hours</i>)								160	