

**1. General information****Course:** CALCULUS I**Type:** BASIC**Degree:** 357 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING**Center:** 303 - E.DE INGENIERÍA INDUSTRIAL Y AEROSPOACIAL DE TOLEDO**Year:** 1**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 56301**ECTS credits:** 6**Academic year:** 2019-20**Group(s):** 40 41 42**Duration:** First semester**Second language:** English**English Friendly:** Y**Bilingual:** N**Lecturer:** DAMIAN CASTAÑO TORRIJOS - Group(s): 42

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2. Pre-Requisites

Not established

3. Justification in the curriculum, relation to other subjects and to the profession

Not established

4. Degree competences achieved in this course**Course competences**

Code	Description
A01	To understand and have knowledge in an area of study that moves on from the general education attained at secondary level and usually found at a level that, while supported in advanced text books, also includes some aspects that include knowledge found at the cutting edge of the field of study.
A02	To know how to apply knowledge to work or vocation in a professional manner and possess the competences that are usually demonstrated by the formulation and defence of arguments and the resolution of problems in the field of study.
A03	To have the capability to gather and interpret relevant data (normally within the area of study) to make judgements that include a reflection on themes of a social, scientific or ethical nature.
A07	Knowledge of Information Technology and Communication (ITC).
A08	Appropriate level of oral and written communication.
A12	Knowledge of basic materials and technologies that assist the learning of new methods and theories and enable versatility to adapt to new situations.
A13	Ability to take the initiative to solve problems, take decisions, creativity, critical reasoning and ability to communicate and transmit knowledge, skills and abilities in Electrical Engineering.
A17	Ability to apply principles and methods of quality control.
B01	Ability to solve mathematical problems that occur in engineering. Aptitude to apply knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimization.

5. Objectives or Learning Outcomes**Course learning outcomes****Description**

Know the use of the functions of one and various variables including its derivation, integration and graphic representation

To know the fundamentals and applications of Optimization

Know the main approaches for resolution through using numerical methods, to use some statistical software packages at user level, data processing, mathematical calculus and visualization, set out algorithms and program through programming language of a high level, visualize functions, geometric figures and data, design experiments, analyze data and interpret results

Be able to express yourself correctly both orally and in writing, and, in particular, to know how to use mathematical language to express with precision quantities and operations that appear in industrial engineering. Become accustomed to working in a team and behaving respectfully.

Additional outcomes

6. Units / Contents

Unit 1:
Unit 2:
Unit 3:
Unit 4:
Unit 5:
Unit 6:

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	R	Description
Class Attendance (theory) [ON-SITE]	Lectures	A01 A08 A12 B01	1	25	N	-	-	
Class Attendance (practical) [ON-SITE]	Problem solving and exercises	A02 A08 A13 A17 B01	0.6	15	N	-	-	
Computer room practice [ON-SITE]	Problem solving and exercises	A02 A07 A08 A13 A17 B01	0.48	12	Y	N	Y	
Individual tutoring sessions [ON-SITE]	Guided or supervised work	A02 A08	0.08	2	N	-	-	
Study and Exam Preparation [OFF-SITE]	Self-study	A01 A02 A03 A12 A13 B01	3.6	90	N	-	-	
Progress test [ON-SITE]	Assessment tests	A01 A02 A03 A07 A08 A12 A13 A17 B01	0.12	3	Y	N	Y	
Final test [ON-SITE]	Assessment tests	A01 A02 A03 A07 A08 A12 A13 A17 B01	0.12	3	Y	Y	Y	
Total:			6	150				
Total credits of in-class work: 2.4			Total class time hours: 60					
Total credits of out of class work: 3.6			Total hours of out of class work: 90					

As: Assessable training activity

Com: Training activity of compulsory overcoming

R: Rescheduling training activity

8. Evaluation criteria and Grading System

Evaluation System	Grading System		Description
	Face-to-Face	Self-Study Student	
Final test	70.00%	0.00%	
Progress Tests	30.00%	0.00%	
Total:	100.00%	0.00%	

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	hours
Computer room practice [PRESENCIAL][Problem solving and exercises]	14
Individual tutoring sessions [PRESENCIAL][Guided or supervised work]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	20
Progress test [PRESENCIAL][Assessment tests]	3
Final test [PRESENCIAL][Assessment tests]	3
Unit 1 (de 6):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	1
Unit 2 (de 6):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	2
Unit 3 (de 6):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	2
Unit 4 (de 6):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	3
Unit 5 (de 6):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	7
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	5

Unit 6 (de 6):	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	1
Global activity	
Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	24
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	14
Computer room practice [PRESENCIAL][Problem solving and exercises]	14
Individual tutoring sessions [PRESENCIAL][Guided or supervised work]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	20
Progress test [PRESENCIAL][Assessment tests]	3
Final test [PRESENCIAL][Assessment tests]	3
Total horas: 80	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Ortega, J. M.	Introducción al análisis matemático	Labor			1993	
APOSTOL, T	Calculus	Reverté	Barcelona		1995	
ARANDA, E.; PEDREGAL, P.	Problemas de Cálculo Vectorial.	Lulu.com			2004	
BURGOS, J.	Cálculo Infinitesimal de Varias Variables.	McGraw-Hill				
DEMIDOVICH	5000 Problemas de Análisis Matemático.	Paraninfo				
GARCIA, A.; LOPEZ, A.; de la VILLA, A.	Cálculo II.	CLAGSA	Madrid		2002	
GRANERO	Cálculo Infinitesimal.	McGraw-Hill	Madrid			
LARSON, R.; HOSTETLE, R.; EDWARDS, B.	Cálculo y Geometría Analítica.	McGraw-Hill	Madrid			
PERAL ALONSO, I.	Primer curso de ecuaciones en derivadas parciales.	Addison-Wesley/ Universidad autónoma de Madrid				
ROGAWSKI, J.	Cálculo: Varias Variables	Reverté			2012	
SALAS, S.; HILLE, E.	Calculus	Reverté				
STEWART, J.	Cálculo multivariable.	Thomson				
ZILL, D.	Ecuaciones diferenciales con aplicaciones de modelado.	Thomson				
Rogawski, J.; Adams, C.	Calculus	Freeman			2015	
Simmons, G.	Calculus with analytic geometry	McGraw-Hill			1996	
Spivak, M.	Calculus	Reverté			1995	