



## Course guide

### 220002 - C1 - Calculus I

Last modified: 10/07/2023

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 749 - MAT - Department of Mathematics.

**Degree:** BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).  
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Compulsory subject).

**Academic year:** 2023    **ECTS Credits:** 6.0    **Languages:** Catalan

#### LECTURER

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**Coordinating lecturer:** ANTONIO MAGAÑA NIETO

**Others:** XAVI PUERTA

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

#### TEACHING METHODOLOGY

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- Attendance sessions of exposition of the contents
- Attendance sessions of practical work.
- Self-developed study and realization of exercises.

During theory lessons the basic concepts will be introduced, as well as examples and practical cases. In the practical lessons, the students are due to solve problems in order to help them to understand the concepts and to acquire the ability of correctly expressing themselves.

The students are due to solve a problems collection during both attendance and not attendance work.

A solved list of problems will be available in order to be a reference for the students.

#### LEARNING OBJECTIVES OF THE SUBJECT

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Providing basic knowledge about differential and integral calculus in one variable. Introduction to complex numbers.

#### STUDY LOAD

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Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	32,0	21.33
Hours medium group	28,0	18.67

**Total learning time:** 150 h



## CONTENTS

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### 1. Numbers and functions

**Full-or-part-time:** 22h 10m  
Theory classes: 3h 34m  
Practical classes: 4h 40m  
Self study : 13h 56m

### 2. Derivation

**Full-or-part-time:** 26h 34m  
Theory classes: 6h 13m  
Self study : 20h 21m

### 3. Integration

**Full-or-part-time:** 49h 44m  
Theory classes: 10h 13m  
Practical classes: 11h 40m  
Self study : 27h 51m

### 4. Series and sequences

**Full-or-part-time:** 51h 32m  
Theory classes: 12h  
Practical classes: 11h 40m  
Self study : 27h 52m

## ACTIVITIES

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### ACTIVITY 1. MIDTERM EXAM

**Full-or-part-time:** 3h  
Theory classes: 3h

### ACTIVITY 2. FINAL EXAM

**Full-or-part-time:** 3h  
Theory classes: 3h

### ACTIVITY 3: THEORY SESSIONS AND PRACTICES

**Full-or-part-time:** 144h  
Theory classes: 26h  
Practical classes: 28h  
Self study: 90h



## GRADING SYSTEM

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Continuous assessment: 25%

First midterm exam: 25%

Final exam: 50%

## EXAMINATION RULES.

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The final and the partial exams are due to be done individually. The teacher may ask the students to identify themselves.

## BIBLIOGRAPHY

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### Basic:

- Salas, Saturnino L. [et al.]. Calculus : una y varias variables [on line]. 4a ed. Barcelona: Reverté, 2002 [Consultation: 14/06/2022].

Available on:

<https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=5635414&query=Calculus%3A+una+y+varias+variables>. ISBN 8429151567.

- Leseduarte Milán, Ma. Carme [et al.]. Càlcul I : problemes i exercicis. Terrassa: UPC. ETSEIT. Departament de Matemàtica Aplicada II, 2003. ISBN 846883369X.

### Complementary:

- Fàbrega Enfedaque, Albert [et al.]. Exàmens de càlcul resolts. Terrassa: Cardellach Còpies, 1998.

- Larson, Ron; Hostetler, Robert P.; Edwards, Bruce H. Cálculo, vol. 1, Cálculo con geometría analítica [on line]. 8a ed. Madrid: McGraw-Hill, 2006 [Consultation: 29/06/2023]. Available on:

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- Magaña Nieto, Antonio [et al.]. Càlcul I : problemes resolts. Barcelona: Edicions UPC, 1994. ISBN 8476534434.

- Guzmán, Miguel. Problemas, conceptos y métodos del análisis matemático : estrategias del pensamiento matemático. Madrid: Pirámide, 1990-1993. ISBN 8436805542.

- Spivak, Michael. Calculus: càlcul infinitesimal [on line]. 2a ed. Barcelona: Reverté, 1995 [Consultation: 14/06/2022]. Available on:

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- Apostol, Tom M.; Vélez, Francisco; Linés, Enrique. Calculus, vol. 1, Cálculo con funciones de una variable, con una introducción al álgebra lineal [on line]. 2a ed. Barcelona: Reverté, 1972 [Consultation: 14/06/2022]. Available on:

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