

Program	09TT - Engineering in Telecommunication Technologies and Services
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Course number and name	
Number	95000002
Name	Calculus Cálculo
Semester	Y1-S1

Credits and contact hours	
ECTS Credits	6
Contact hours	60

Coordinator's name	Ricardo Riaza Rodríguez
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Specific course information		
Description of course content		
A course in the calculus of one variable including real and complex numbers, continuity and limits; differentiation; maxima and minima; elementary functions; integration; sequences and series.		
List of topics to be covered		
1. Real and complex numbers, 2. Functions of one real variable: continuity and limits, 3. Derivation, extrema. 4. Integration. 5. Numerical sequences and series. 6. Functional sequences and series.		
Prerequisites or co-requisites		
None, but it will be assumed that students have precalculus knowledge		
Course category in the program		
<input checked="" type="checkbox"/> R (required)	<input type="checkbox"/> E (elective)	<input type="checkbox"/> SE (selective elective)

Specific goals for the course

Specific outcomes of instruction

- RA32: To realize the importance of abstract reasoning and the need to translate problems in engineering into mathematical formulations.
 RA33: To understand the advantage and the scope of the mathematical language in the description of technical problems.
 RA38: To achieve dexterity in the calculus and the use of real functions in one or several variables.
 RA39: To know how to work with functions defined by infinite series and how to analyze their convergence.
 RA40: To be proficient in the differential and integral calculus of functions.

Student outcomes addressed by the course

- CEB1
 CG1, CG2, CG5

Bibliography and supplemental materials

- S. L. Salas, E. Hille, G. J. Etgen, Calculus, Volumen I, 4ª edición española, ed. Reverté, 2002.
- M. Spivak, Calculus, 2ª edición, ed. Reverté, 1996
- S. Abbott, Understanding Analysis, Springer, 2001.
- J. Burgos, Cálculo infinitesimal en una variable, 2ª ed. McGraw Hill, 2007
- F. Galindo, H. Sanz y L. A. Tristán, Guía práctica de Cálculo infinitesimal en una variable real, Thomson Paraninfo, 2003.
- S. R. Ghorpade and B. V. Limaye, A course in Calculus and Real Analysis, Springer-Verlag, 2006.
- R. Larson y B. H. Edwards, Cálculo de una variable, 9ª edición en español, McGraw Hill, 2010.
- D. Pestana et al., Curso práctico de Cálculo y Precálculo, Ariel, 2000.
- R. Riaza, Problemas de Cálculo en una variable, Servicio de Publicaciones ETSIT, 2012
- G. Strang, Calculus, Wellesley Cambridge Press, 1991:
<http://ocw.mit.edu/resources/res-18-001-calculus-online-textbook-spring-2005/textbook/>
- WEB: <http://moodle.upm.es/titulaciones/oficiales>

Teaching methodology

<u> X </u> lectures	<u> X </u> problem solving sessions	<u> X </u> collaborative actions	<u> </u> laboratory sessions
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Other: