Program	**09TT- Engineering in Telecommunication Technologies and Services**

Course number and name	
Number	95000080
Name	Systems for Symbolic Calculation Sistemas de cálculo simbólico
Semester	Y2-S3

Credits and contact hours	
ECTS Credits	5
Contact hours	45

Coordinator's name	Jesús C. Abderramán Marrero

Specific course information

Description of course content

The course is an introduction to computer algebra systems (CAS) and the symbolic computation through Maple, with applications to topics regarding undergraduate engineering mathematics. Special emphasis is done in introductory applications on telecommunication engineering.
Three hours per week of CAS workshop at the computer math laboratory.

List of topics to be covered

1. Introduction to Maple
2. Basic differential and integral numerical methods
3. Solving linear and nonlinear algebraic equations
4. Practical applications

Prerequisites or co-requisites

An undergraduate one-year level in Algebra and Calculus.

Course category in the program

__ R (required)	**_X_ E (elective)**	**__ SE (selective elective)**

Specific goals for the course

Specific outcomes of instruction

RA142 – Basic knowledge of Maple programming, concepts of the operation systems, storage, files, and mathematical algorithms for solving typical problems of the physics and engineering.

RA143 – Intermediary level graphics managing with Maple.

RA144 – Capacity for analysis, programming, and coding of the problems assigned during the course.

RA145 – Computational use and verification of the mathematical foundations necessary for handling problems of applied sciences and engineering.

RA146 - Ability for the computation and the application of the differential and integral calculus in the study of functions, and the matrix theory on algebraic systems.

RA147 – Elementary skills on numerical approximations in the theory of functions.

RA148 – Ability for developing research programs on elementary real-world problems.

Student outcomes addressed by the course

CEB1, CECT1, CECT2, CECT3, CG1- CG13.

Bibliography and supplemental materials
M.L. Abell, J.P. Braselton. Maple By Example. Academic Press, San Diego, CA, 2005. (C7310 ABE MAP) F. Garvan. The MAPLE Book. Chapman & Hall/CRC, Boca Raton, FL, 2001. (C7310 GAR MAP) D. Richards. Advanced Mathematical Methods with Maple. Cambridge University Press, Cambridge, UK, 2001. (C7310 RIC ADV) Handbook of Systems for Symbolic Computation, edited by the team of professors of the course. Maple package: http://www.addlink.es Virtual sessions: http://moodle.upm.es/ Computer Laboratory of Math. Department

Teaching methodology			
__ lectures	**_X_ problem solving sessions**	**_X_ collaborative actions**	**_X_ laboratory sessions**
Other:			