



## **Interactive methodology based in e-learning to help the engineering students to understand concepts and practices**

Rosa M. Benito, Juan C. Losada, Francisco J. Arranz, and Luis Seidel

Universidad Politécnica de Madrid, Grupo de Sistemas Complejos, MADRID, Spain (rosamaria.benito@upm.es, 34 91336 5726)

Innovative educational experiences of e-learning are carrying out in the Technical University of Madrid both in undergraduate and postgraduate studies. In this work we present the main characteristic of the e-learning courses in the Master of Physics of Complex Systems and the results got from the evaluation in the last two years. The methodology used has the objective to encourage students to be active in the learning process while being guided to reach their own conclusions concerning the different phenomena presented. To that end, the learning materials is developed with numerous interactive tools that are implemented among the theoretical description of the lessons. The content of the courses incorporate several exercises with help menu, and activities. They are an important complement of the theory presented. We believe that doing these exercises would help better understand the concept and phenomena introduced. It also include simulations programs that allow the students to "investigate" and practice by changing the value of the parameters and get different graphic representations of the process under study, and videos corresponding to real experiments so that students can take data.