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**Ruth Rodriguez\*** ([ruthrdz@itesm.mx](mailto:ruthrdz@itesm.mx)), Math Department, Office A7227, Av. E. Garza Sada 2501, Col. Tecnológico, 64849 Monterrey, Nuevo Leon, Mexico. *Teaching and Learning Differential Equations for Engineers through Modelling and Technology*. Preliminary report.

The purpose of this paper is to present an experience of an educational practice in a private university in México about a different way to teach a Differential Equations course for future engineers based on a didactical proposal developed through modelling. This proposal emphasizes that Mathematics is a human activity that answers several problems of different nature, and throughout this problem solving activity it is likely that the emergence of mathematical concepts, notions and procedures occurs. We want to justify in this chapter how modelling is an important base to design this proposal. Evidence has shown that future engineers achieve better understanding of the math concepts after living this educational practice and further develop other skills, as social, communicative, modeling and technological, along with the mathematical. (Received September 17, 2013)