



### Teaching Engineers in the Seventeenth Century: The Aula de Fortificação in Lisbon (Portugal) (ID 332)

**M. Rosa Massa-Esteve** (Universitat Politècnica de Catalunya, Barcelona, Spain), **Antónia Filhao Conde** (Universidade de Évora, Evora, Portugal)

In the seventeenth century, technical developments in the military field (construction, fortification, pyro-ballistics, strategy) and in scientific instruments increasingly made the mathematical disciplines a universal tool. These disciplines, classified by the authors into pure and "mixed" mathematics, provided the basis for the training of engineers. This training gave rise to a series of textbooks named *Cursus Mathematicus* which set out the scope of mathematical developments. Theoretical and practical education was necessary for military engineers, especially the training in practical geometry for designing and building all kinds of fortifications in accordance with the historical circumstances prevailing in

168

---

Prague, Czech Republic, 22–24 September, 2016

Portugal at time. The fortification of borders became particularly important after the definitive separation from Spain in 1640.

Thus, the aim of this paper is to analyze this training at the Aula de Fortificação, founded in 1647 in Lisbon (Portugal) by the Chief-cosmographer and Chief-engineer Luis Serrão Pimentel (1613–1679). In his work, *Methodo Lusitanico*, written in Portuguese (1680), Serrão Pimentel was trying to pioneer a particularly Portuguese way of practicing engineering. It is our intention to conduct an in-depth analysis of some aspects of the syllabus at the Aula in which it is possible to determine the main advances of mathematics in the late seventeenth century.

**Keywords:** Mathematics, Pure Mathematics, Mixed Mathematics, Fortification, Engineering, Seventeenth century, Portugal, Luis Serrão Pimentel, Aula de Fortificação