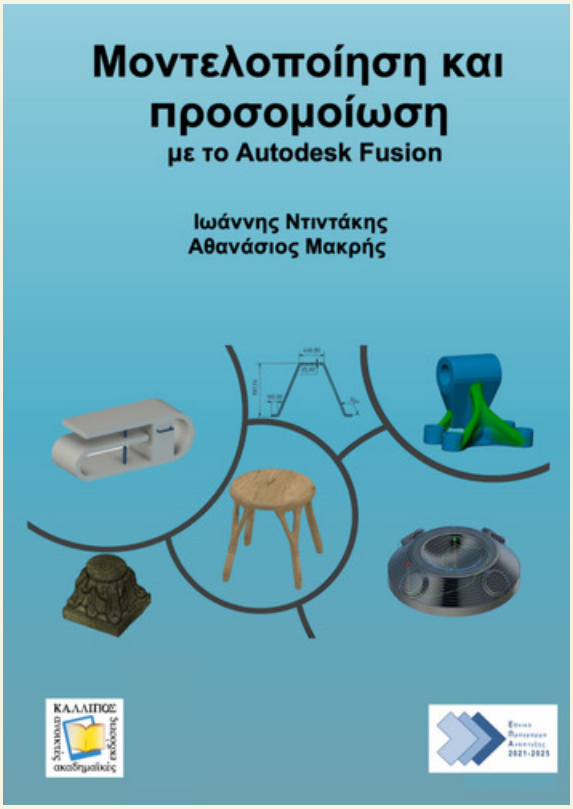

METADATA

Title: Modeling and simulation with Autodesk Fusion

Other Titles: -

Language: Greek

Authors: Ntintakis, I., Lecturer, HMU, Makris, A., Laboratory and Teaching staff, UTH

ISBN: 978-618-228-196-3

Subject: MATHEMATICS AND COMPUTER SCIENCE, ENGINEERING AND TECHNOLOGY, HUMANITIES AND ARTS

Keywords: Solid modeling / Surface modeling / Parametric modeling / CNC programming / Process simulation

Bibliographic Reference: Ntintakis, I., & Makris, A. (2024). Modeling and simulation with Autodesk Fusion [Undergraduate textbook]. Kallipos, Open Academic Editions. http://dx.doi.org/10.57713/kallipos-431

Abstract

The present textbook is intended to be used as an educational tool for undergraduate students and, more generally, by designers, design engineers or other related specialties involved in industrial product design or the design of other constructions. Those interested in leveraging modern software like Fusion will find it particularly beneficial. The textbook is divided into ten chapters. The first two chapters exclusively focus on two-dimensional sketch design. The process of creating sketches is a necessary step for three-dimensional geometry creation. Specifically, Chapter 1 details all the commands of two-dimensional sketch design and modification commands. Chapter 2 is dedicated to two-dimensional parametric design, using either geometric or dimensional constraints. Chapter 3 provides an introduction to 3D design, covering all known commands for three-dimensional modeling through examples. In Chapter 4, all modification commands for three-dimensional models are analyzed, such as transformation commands for solid models or commands for creating local modifications. Chapter 5 presents, through examples, the process of designing and editing mesh models. Chapter 6 thoroughly explains commands for creating surface models from sketches or using basic surface models. The available tools for modifying surface models are also discussed in the latter part of the chapter. In Chapter 7, the process and available tools for creating assembly models are presented. Chapter 8 introduces the process of programming 3D models in CAM environment. It covers the entire model preparation process, tool selection for machining, and all two-dimensional and three-dimensional machining operations. In Chapter 9, the concept of generative design is analyzed, along with the process of conducting a relevant study. The final chapter, Chapter 10, presents the available tools for creating technical drawings.

The Project is funded by the National Development Programme 2021-2025 of the Ministry of Education and Religious Affairs and implemented by the Special Account for Research Funds of the National Technical University of Athens and the Hellenic Academic Libraries Link.