Mechanical Design


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Abstract

Design is the key activity in the generation of successful products. Without attention to the requirements and specification, generation and selection of a suitable concept and appropriate detailed design and manufacture, products will not be able to compete effectively in the market place. This book explores the process of design with specific emphasis on mechanical items. This includes consideration of the design and selection of components that involve relative motion to each other such as bearings, shafts, gears, belts, chains, dynamic seals, clutches and brakes. In addition a number of essential machine elements such as fasteners, springs, static seals, casings, sensors and actuators, which allow the implementation of useful devices, are included. The emphasis in the text is on the reader acquiring useful skills and developing understanding. Most applications of design do not result in single answers. This realistic insight has been recognised in the development of the material presented and many of the worked examples and worksheet questions do not have unique solutions. Instead a possible answer is offered to allow the reader to develop their understanding and insight and as confidence and abilities increase, alternative solutions can be explored. The book is supported, if adopted as a course textbook by approximately 2000 lecture slides, worked solutions for worksheet questions and a number of spreadsheets to speed up some of the analysis or design procedures.

Item Type: Book

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Engineers and designers use mechanical engineering and design software to model, validate, and communicate ideas before production. Additional tools are available and sometimes integrated in the CAD software for manufacturing products on a CNC machine or 3D printer. Mechanical engineering software is employed across several industries, including industrial machine design, automotive, and consumer products. Types of mechanical engineering and design. COMPUTER-AIDED DESIGN (CAD).