

Recommended Open Educational Resources for an Undergraduate Course in Engineering Mechanics: Statics

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Engineering Statics: Open and Interactive by Daniel W. Baker and William Hynes

URL: <https://engineeringstatics.org/book-1.html>

In Engineering, there are several open educational resources for certain fundamental subjects, but the selection is rather small. For Engineering Mechanics, which encompasses the traditional second-year courses of Statics, Dynamics, and Deformable Body Mechanics, there are only a few texts that cover the major content in a comprehensive fashion. Furthermore, some available texts are geared towards the high school or early College physics Student rather than Engineering Students.

Engineering Statics: Open and Interactive is appropriate for undergraduate Students who are taking Engineering Mechanics: Statics after having completed Calculus I and Calculus-based Physics I. The text covers major content area in an order which is relatively consistent with other non-OER published texts, and thus could be used in place of commonly used undergraduate Statics books.

The open textbook is available through the URL linked above as an interactive textbook, but it could also be downloaded as a single PDF. It is divided into ten chapters. Each chapter provides an introduction, background information, necessary equations, example problems, and practice exercises. Within the text, there are interactive diagrams which provide an alternate means with which to engage with the content. These are very useful and a benefit to using this text.

The Back Matter of the text is also well-organized, with references to common notation, useful mathematics, and some steel properties.

The exercises at the end of each chapter are relevant to the content of the respective chapter. There are some chapters that have inadequate chapter problems – in particular, the chapter on friction would need to be supplemented with additional problems created by the instructor or drawn from another source. However, the interactive nature of the chapter problems is very useful. Students may solve the problems and then view the answers. The numeric values in the problems is dynamic – in other words, the student could practice the same problems again with different numbers.

This text would be a great candidate for developing supplementary materials – primarily examples and end-of-chapter problems.

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