Acoustics for Engineers
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"Acoustics for Engineers" is identified in the preface as "*an introductory course in engineering acoustics for students with a basic knowledge of mathematics*" and this would definitely constitute a true statement. The book covers a wide array of topics in acoustics, it makes extensive use of analogies familiar to those with a background in either electrical or mechanical engineering, and while mathematical derivations of most equations are kept to a minimum, the required steps are clearly outlined by the authors and could be easily replicated by anyone familiar with integral-differential calculus. What is a bit surprising is the next sentence stating that "*each chapter deals with a well-defined topic and represents the material for a two-hour lecture*;" although the first part of the sentence is totally accurate, I fail to see how any of these chapters could be covered in a two-hour lecture even "*under the guidance of an academic teacher*" as suggested by the authors. Still this is clearly a book that originated in—and that is intended for—an academic setting and this is the context that I will use for its review.

First the not-so-good: The notation is cumbersome, with complex quantities represented with underlines that are sized to the width of the quantity so ratios of complex quantities (or equalities between them) rapidly become an exercise in deciphering a lot of horizontal elements. Since the authors also use the '=' sign (in subscript) to denote the steady-state component of a function, this rapidly adds to confusion! The book may be a representation of lectures that were given at the Rensselaer Polytechnic Institute (hence, the "*Troy Lectures*" subtitle) and standard notation for complex quantities is not something that easily translates to the writing board, but couldn't the use of tildes make the reading easier? Just a suggestion for a future edition.

Now the good: this is a wonderful book (note the appropriate use of underlined notation ☺) with 14 useful chapters, each covering a specific topic with the right amount of illustration and a well-guided presentation of the material. Chapter 2 "*Mechanic & Acoustic Oscillations*" is a case in point, where the information is provided with the natural flow that an experienced teacher could deliver. The only thing left to add is a couple of specific examples for the students to solve. Chapter 3 "*Electromagnetic and Electroacoustic Analogies*" reveals the engineering background of the authors and lays out very clearly the foundation for the next three chapters dealing with transduction principles, magnetic-field transducers, and their electric-field counterparts. All chapters contain numerous illustrations and graphs that are both clear and strategically located.

The wave equation is introduced in Chapter 7 and the explanations are clear and effective. The use of a lossless media approximation serves as a natural introduction to the following chapters that include "*Horns & Stepped Ducts*," "*Spherical Sound Sources & Line Arrays*," and "*Piston Membranes, Diffraction & Scattering*." Once again, the presentation of the material follows a structured, and easy-to-read, approach and save for the lack of specific exercises, the material is well-suited to a lecture format.

In Chapter 11 "*Dissipation, Reflection, Refraction, and Absorption*" the wave equation is presented with the addition of damping and the analogy with transmission line model is used. The authors move very fast through an important topic like absorbers (that in a lecture environment could benefit from specific examples and/or demonstration) but the information is still up-to-date and very useful. Chapters 12 and 13 "*Geometric Acoustics and Diffuse Sound Fields*" and "*Isolation of Air- and Structure-Borne Sound*" represent a general survey of what would constitute a substantial portion of a full-length course in architectural acoustics but once again the explanations are clear and effective. Chapter 14 "*Noise Control—A Survey*" deals with a variety of topics ranging from outdoor noise propagation, barrier attenuation, and noise abatement methodologies, all of which are presented in a concise yet effective fashion.

What's not to like about *Acoustics for Engineers?* Some of the notation is all that I can think of. The book is very well structured and it constitutes an excellent study guide for both students and teachers. With the addition of appropriate examples and potential demonstrations, every one of its chapters can be incorporated into superb lectures although the two-hour suggested format will be clearly exceeded! Maybe the preface should have incorporated the final paragraph of the Appendix, i.e. "*the current textbook suffices as the sole teaching material for an introductory course given by experienced academic teachers who are able to provide specific explanations and stress relevant topics according to the prior knowledge and special interests of their students*." Now, this is a totally true and useful statement that perfectly defines a wonderful book that should be considered for the libraries of either teachers or students of acoustics at the college level.

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