

# **Cost Analysis and Estimating for Engineering** and **Management**

By Phillip F. Ostwald, Timothy S. McLaren Ph.D.



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This popular book supplies readers with the latest principles and techniques for the evaluation of engineering design. The emphasis is on analysis and estimating. Included in this new edition is a chapter that introduces principles that deal with bringing inventions to the marketplace. It analyzes labor, material, accounting, and forecasting; then the theme of estimating is developed, with a study of methods, operations, and products. A versatile and extremely usable book, it's the perfect resource for engineers, managers, and entrepreneurs.



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#### **Editorial Review**

From the Back Cover

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This first edition of *Cost Analysis and Estimating for Engineering and Management* provides the latest principles and techniques for the evaluation of engineering design. The theme for the book begins with four chapters devoted to an analysis of labor, material, accounting, and forecasting. In the next four chapters estimating is developed, and methods, operations, and product chapters are given. With those chapters understood, attention moves to Chapters 9 and 10, "Cost Analysis and Engineering Economy." Chapter 11, "The Enterprise, Entrepreneurship, and Imaginamachina," concludes the book, and it introduces principles that deal with bringing inventions to the marketplace. Wise and calculated risk taking for the entrepreneur (read engineer and manager) are important to the broader understanding of engineering for students. The organization of this book develops these principles in a systematic way.

With increasing importance of design over rote skills in contemporary engineering courses, this book can be used for a variety of teaching situations: for lecture only, for lecture with a laboratory menu, or for professional mentoring with business, and developed field trips. Courses that connect to on-line live or delayed video instruction can use this book, as the authors have personal experience with these delivery modes. Furthermore, lifelong learning programs for the professional in either formal or informal settings can use the book.

Academic requirements for this book/course may vary, and we believe that the book is suitable for a number of teaching approaches. The book has been written to appeal to engineering/management/technology settings. The student needs a mathematical maturity of algebra and introductory calculus. Typically, this book is used in the later college periods, and sometimes it coincides with the capstone course or other summary courses that occur in the final semesters. It is also suitable for graduate level courses in engineering/technology and management.

The instructor will notice Internet requirements that search for information and apply it in practical context. We provide Internet addresses for numerous assignments. (Regrettably, these addresses may change from time to time. Fortunately, many students are adept at finding their own way around the Internet.) In the interactive environment of teaching, this book is a part of modern courseware. Word processing and spreadsheet skills are assumed, and some CAD ability is always helpful. The student must have access to a computer, and system requirements would be typical of more advanced personal or college Pentium computers.

Various academic levels, either undergraduate or graduate, and backgrounds are appropriate and the instructor will find that this book is fitting for a variety of teaching styles. The authors have attempted to involve the instructor in the leadership of many exercises, calling on you, the instructor, to localize the

assignments to your needs.

The book has more material than can be covered in one semester or quarter, and thus chapters can be chosen to meet the objectives of each class. Chapter order can be adjusted. For example, if the students already have an understanding of statistics, then Chapter 5 material can be excluded. Other sections can be dropped depending on student preparation and course objectives. Now and then the term "optional" is used with sectional material, and the instructor can either appropriately overlook that section or include it for enriching purposes. The instructor will find that the book is versatile.

This book has a range of difficulty for Questions for Discussion, Problems, Challenge Problems, Practical Applications, and Case Studies. Throughout the book, the authors have attempted to give the instructor the opportunity for outcomes-evaluation of student work with these many exercises.

There are 128 Questions for Discussion in the 11 chapters. They are qualitative and require back reading and a response of a few sentences for a thoughtful reply.

We believe cost analysis and estimating to be a problem-solving activity; therefore, many of the 245 Problems and 65 Challenge Problems request computations or sketches. Whenever the student is asked to set up and solve open-ended problems, much learning occurs. Indeed, some problems may have several appropriate solutions, and that depends on the assumptions and the route for the solution. This paradigm is instructive in a broader engineering context.

The problems have varying levels of difficulty. We want the Problems and the Challenge Problems to be tractable, either with calculator or spreadsheet, where the emphasis is on teaching concepts. It is not our desire to cause excessive computation, which is the nature of cost analysis and estimating problems. Thus, this book ignores software data and encyclopedias that are found on the Internet for estimating designs. Those software applications restrict the learning of principles. Nor do we give much attention to the minutia of extensive design practices, as those temporal trade details can be learned on the job, if necessary.

There is an end-of-chapter section that we call the Practical Application. The purpose of the Practical Application is to uncouple the student from books, libraries, and the classroom. As will be seen throughout the book, Practical Applications introduce the student to experiences in the real world. For example, it encourages field trips and communication with engineers, technologists, and management professionals. The instructor will appreciate this experiential approach, allowing him or her to use Practical Applications in exciting ways.

The end-of-chapter Case Studies are open ended, perhaps having several solutions. Students are often disturbed by this peculiarity, but instructors recognize cost analysis and estimating courses are unlike calculus courses with their singularity of correct answers.

The book contains 21,Picture Lessons. They describe important historical contributions of engineering. It is essential that students have an appreciation of the grand heritage and the remarkable two centuries of technological achievement of our profession. Selection of some of the Picture Lessons was from "The 20th Century's Greatest Engineering Achievements," a collection identified by the National Academy of Engineering.

For the instructor, a comprehensive Solution's Manual and CD is available. Additional PowerPoint helps are included. This CD can be requested from the Prentice Hall college representative or from Dr. Timothy McLaren.

The authors are grateful to many people. Their advice and information has made this a much better book. For

in writing a book of this magnitude, the authors are aware that friends and colleagues are hidden, but they are very important advisers. We are indebted to the following: Lawrence E. Carlson and Ross Corotis of the University of Colorado, Boulder; Rodney Ehlers, Boulder, Colorado; Stephen Burish; Boulder, Colorado; Lynne E. Lyell, Fort Collins, Colorado; Charles W Stirk, Susannah Ferguson, and Qin Liu of CostVision, Boulder, Colorado; Michael Usrey, Boulder, Colorado; Edward Lyell, Adams State College, Alamosa, Colorado; Donald E. Forkner, Storage Technology Corporation, Louisville, Colorado; Mark Ostwald, Fish and Wildlife Service, Lacey, Washington; Mark Willcoxon, Coors Engineering, Golden, Colorado; Kurt Mackes, Colorado State University, Fort Collins, Colorado; Roger Eiss, Vancouver, Washington; Kevin Kilty, Vancouver, Washington; and Jack Swearengen, Santa Rosa, California.

The names used in the Problems and Case Studies are of real people, and they are mentioned because of our sincere regard for their contribution and friendship.

PHILLIP F. OSTWALD TIMOTHY S. MCLAREN

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Do you have favorite book? If you have, what is your favorite's book? Reserve is very important thing for us to know everything in the world. Each reserve has different aim or goal; it means that reserve has different type. Some people sense enjoy to spend their the perfect time to read a book. They are reading whatever they get because their hobby is definitely reading a book. What about the person who don't like reading a book? Sometime, individual feel need book if they found difficult problem or exercise. Well, probably you'll have this Cost Analysis and Estimating for Engineering and Management.

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