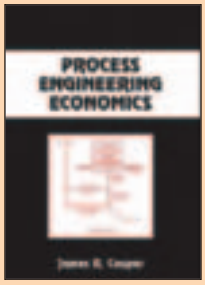
Books

Process Engineering Economics

James R. Couper, Marcel Dekker, Inc., New York, NY, 423 pp., $150.00, 2003



What distinguishes engineers from scientists is their ability to obtain financial dividends from scientific invention. Not that scientists do not want to obtain financial dividends from their inventions, but, in general, scientists are more interested in expanding society's knowledge base, while engineers are interested in raising society's standard of living. To do that, engineers must have a basic understanding of economics and know how to calculate the financial benefit from a scientific or technological advance. This ability has become particularly important since the Financial Revolution of the 1980s, when control of the corporation passed from corporate management to institutional fund managers.

This textbook shows students and practicing engineers how the economic evaluation of projects enters corporate finance. Chapter 1 presents the evolution of an engineer's corporate career (progressively moving from project engineering to project evaluation, then to project management, and finally to corporate management). Chapter 2 discusses how corporations are financed, while Chapter 3 explains how corporate financial statements are calculated, produced and interpreted. This is an important chapter because it shows how individual engineering projects impact the proverbial "bottom line." Chapters 4 and 5 present methods for estimating capital requirements and operating expenses, respectively. Chapter 4 has a particularly good literature review of capital estimation.

Chapter 6 discusses the time value of money, while Chapter 7 explains depreciation, depletion, amortization and taxes. In Chapter 8, Couper clearly explains the concept of cash flow and its importance for project evaluation. His method for calculating cash flow is highly visual and readily adaptable for presentation to management. Chapter 9 outlines methods for estimating project profitability. It presents the advantages of using net present worth and the disadvantages of using rate of return. Chapter 10 discusses sensitivity and uncertainty analysis and Chapter 11 covers feasibility analysis (with an extensive example). Chapter 12 contains methods for choosing between alternatives and replacements, while Chapter 13 covers economic balance.

Process Engineering Economics may well be the best text available for showing how project evaluation and economics impact corporation finances; unfortunately, it contains a number of distracting blemishes. There are several run-on sentences in the text, as well as misspellings. Table 7.6 has a title and column headings, but no row entries. Finally, the text is bound poorly and is unlikely to survive a semester of undergraduate usage. However, even with these problems, this book is valuable for demonstrating the impact of project evaluation and economics on corporation finances. Hopefully, the second edition will correct the problems of this edition.

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An Introduction to Materials Engineering and Science for Chemical and Materials Engineers

Brian S. Mitchell, John Wiley & Sons, Inc., Hoboken, NJ, 954 pp., $145.00, 2003

Future chemical or materials engineers require an understanding of chemical structure and engineering fundamentals in order to further comprehend the properties and applications of engineering materials. As engineers continue to address materials-related issues in such emerging areas as nanotechnology and alternative energy, it is necessary to gain a solid traditional foundation in materials science based on established engineering principles. Organized by both engineering subject and materials class to provide versatility in structuring and presentation of information, this book offers a solid foundation in materials engineering and science.

Materials and ceramics, as well as such advanced topics as polymers, composites and biomaterials, are covered in comprehensive detail. Incorporating key concepts of thermodynamics, kinetics and transport phenomena, this book also addresses materials processing, mechanical and electrical properties, and materials selection and design to equip tomorrow's materials engineers with vital practical instruction.

Riegel's Handbook of Chemistry, 10th Ed.

James A. Kent, Editor, Kluwer Academic/Plenum Publishers, New York, NY, 1373 pp., $595.00, 2003

Substantially refined from the previous editions, some top 50 experts cover the chemistry and technology that underlie the major components of the chemical process industries. Every chapter has been thoroughly updated and several have been completely redesigned and rewritten to ensure that readers receive the most current information available.

This edition includes a new chapter on industrial cell culture, a companion piece to the well-established chapter on fermentation. Together, these two chapters offer insight and information on the burgeoning field of biochemical engineering. Also, a new approach has been taken with the chapter on agrochemicals. It now presents, in several tables, an enormous amount of vital information on pesticides, herbicides and fungicides. Comprehensive in scope and easy to use, the handbook is an essential working tool for chemical and process engineers, as well as chemists, plant and safety managers, regulatory agency personnel and teachers.