Journal of Engineering Materials and Technology

Book Review

Measuring Engineering Properties of Soil by Warrey K. Wray, Prentice-Hall International Series in Civil Engineering and Engineering Mechanics, Prentice-Hall, Inc., Englewood Cliffs, N.J. pp. 276.

REVIEWED BY RICHARD P. LONG[1]

The author has prepared a clearly written laboratory manual containing experiments normally covered in the typical first undergraduate course on the subject. The sequence of the experiments appears logical. The beginning chapter is on report writing. Most procedures appear to be similar to those found in ASTM. A few of the procedures presented might be slightly complicated for students in a first course and simpler procedures could be substituted.

The introduction states that the present book was expanded from one for students in a construction Engineering Technology program. Perhaps this explains the unusual detail in the chapters on: Unit Weight (Chap. 2), Effective Stress (Chap. 8), and Settlement (Chap. 10). In most engineering programs these topics are treated sufficiently in Geotechnical lectures and do not require repetition in the laboratory manual.

The author indicates that the experiments could be done in a two-hour laboratory period. Students will have difficulty completing the Specific Gravity experiment in two hours. The procedures for Specific Gravity determinations could also be simplified. Chapter 7 does not discuss the presence of air in the water and soil systems and its effect on the measured versus the actual permeability coefficient.

Most instructors of an undergraduate laboratory in Soil Mechanics will find this book a useful reference for students.

Conduction of Heat in Solids – 2nd edition, H. S. Carslow and J. C. Jaeger, Oxford University Press, N.Y. 1986, 510 pp., $32.50 paperback.

REVIEWED BY J. E. MORRAL[2]

The classic "second edition" which first appeared in 1959 has now been issued as a paperback. Except for the cover it is the same book. Even though it is now more than twenty five years old it is still a standard reference for exact solutions to a variety of boundary value problems. Problems with static and moving coordinates are covered as are isotropic and anisotropic media. There is a short chapter on numerical methods, but the strength of this work is in providing explicit solutions to problems of practical interest in a form that are understandable to the engineer without sacrificing mathematical rigor.

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Handbook of Mechanics, Materials, and Structures, ed. by A. Blake, Wiley Series in Mechanical Engineering Practice, John Wiley and Sons, New York, 1985, pp. 710, Price $64.50.

REVIEWED BY H. I. EPSTEIN[1]

This interesting reference book presents information on a diversity of facets of mechanics, materials and structures. The book is replete with equations and a minimum of derivations or descriptive material. As such, this handbook is a good first source for a quick refresher on a mathematical technique or structural formula or the like. Reference lists are extensive when more detailed information on a subject is desired.

There are ten Chapters, each contributed by an authority in the field. Chapters 1 and 2 cover engineering mathematics, statics and dynamics. Chapter 3 presents practical strength of materials information applicable to mechanical and structural design. Chapter 4 includes conventional materials testing along with metallurgical principles. Chapter 5 is an introduction to experimental stress analysis. Chapter 6 deals with elasticity, plasticity and elastic stability. Chapters 7, 8 and 9 treat specific structural members: straight beams and columns; curved members, and plates. Chapter 10 is concerned with pressure vessel and piping design.

For someone who deals with a majority of the topics covered by this handbook, this reference would make a good addition to their library.

Integral Methods in Science and Engineering, ed. by F. Payne, C. Corduneanu, A. Haji-Sheikh and T. Huang, Hemisphere Publishing Corp., Washington, 1986, pp. 653, $95.50.

REVIEWED BY H. I. EPSTEIN

This is a collection of papers presented at the first international conference on global techniques, Integral Methods in Science and Engineering, held at the University of Texas at Arlington on March 18–21, 1985. There are over fifty papers grouped into areas of: Mathematical Physics; Mathematical Analysis; Fluid Mechanics; Solid Mechanics; Thermal Sciences, and; Optimization and Population Dynamics.

For a researcher in any of these areas this collection would make a good reference as it contains a wide diversity of state-of-the-art techniques and applications. The average engineer looking for information on specific problems would most likely be disappointed by purchasing collections of papers such as these.

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