

## A Survey of Computational Physics: Introductory Computational Science

By Rubin H. Landau, Manuel José Páez & Cristian C. Bordeianu  
Princeton University Press, 2008.

With the selection of Java (1.5 and later) as the programming language, this new book from Landau, et. al. is well-suited to use in any upper-level computer science course. The inclusion of matrix computing, object-oriented computing and adaptive-step size integrators, along with the review of computational science basics would make this an ideal text for use in an advanced computing techniques course. For the undergraduate or graduate student interested in data mining, or scientific methods, the approach used in this text is ideal. With the accompanying CD, illustrations of the text topics are provided, for better understanding and learning.

The italicized paragraphs at the beginning of each chapter are a strong feature, setting the stage for the chapter that follows and indicating to the reader how this text is supported elsewhere or builds on previous material. Additional external citations are also mentioned at this point.

Chapter 4 provides a good bridge for computational science and object-oriented programming (OOP). By providing worked examples, traditional problems, such as additive sine functions, are presented with both procedural and object-oriented program solutions. This side-by-side presentation approach provides an outstanding opportunity for procedural programming to move to OOP, while permitting experienced OO programmers to see how computational science can be used to implement standard problems.

Chapter 8 discusses solving systems of equations with matrices and data fitting. This is a key area for network performance and traffic modeling, a topic which many undergraduate and graduate curriculums include. While offering informed guidance regarding other sources and available libraries, the merits and limitations of matrix computing are addressed (Section 8.3.1) in a manner that may save students and faculty researchers significant time in designing and implementing matrix solutions. References to materials found on the CD are indicated in the margin of the text, making this a truly integrated offering for the library of anyone working in computational science.

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