

A C K N O W L E D G M E N T S

A great many people have contributed to this book. Sen-Ben Liao of Lawrence Livermore National Laboratory, James Whitenton of Southern Polytechnic State University, and Jerry Shi of Pasadena City College performed the Herculean task of working out solutions for every one of the homework problems in the book. At John Wiley publishers, the book received support from John LaVacca and Jennifer Yee, the editors who oversaw the entire project from start to finish, as well as Senior Managing Editor Mary Donovan and Editorial Assistant Samantha Hart. We thank Patricia Gutierrez and the Lumina team, for pulling all the pieces together during the complex production process, and Course Developers Corrina Santos and Kimberly Eskin, for masterfully developing the *WileyPLUS* course and online resources. We also thank Jon Boylan for the art and cover design; Helen Walden for her copyediting; and Donna Mulder for her proofreading.

Finally, our external reviewers have been outstanding and we acknowledge here our debt to each member of that team.

Maris A. Abolins, *Michigan State University*
Jonathan Abramson, *Portland State University*
Omar Adawi, *Parkland College*
Edward Adelson, *Ohio State University*
Nural Akchurin, *Texas Tech*
Yildirim Aktas, *University of North Carolina-Charlotte*
Barbara Andereck, *Ohio Wesleyan University*
Tetyana Antimirova, *Ryerson University*
Mark Arnett, *Kirkwood Community College*
Stephen R. Baker, *Naval Postgraduate School*
Arun Bansil, *Northeastern University*
Richard Barber, *Santa Clara University*
Neil Basecu, *Westchester Community College*
Anand Batra, *Howard University*
Sidi Benzahra, *California State Polytechnic University, Pomona*
Kenneth Bolland, *The Ohio State University*
Richard Bone, *Florida International University*
Michael E. Browne, *University of Idaho*
Timothy J. Burns, *Leeward Community College*
Joseph Buschi, *Manhattan College*
George Caplan, *Wellesley College*
Philip A. Casabella, *Rensselaer Polytechnic Institute*
Randall Caton, *Christopher Newport College*
John Cerne, *University at Buffalo, SUNY*
Roger Clapp, *University of South Florida*
W. R. Conkie, *Queen's University*
Renate Crawford, *University of Massachusetts-Dartmouth*
Mike Crivello, *San Diego State University*
Robert N. Davie, Jr., *St. Petersburg Junior College*
Cheryl K. Dellai, *Glendale Community College*
Eric R. Dietz, *California State University at Chico*
N. John DiNardo, *Drexel University*

Eugene Dunnam, *University of Florida*
Robert Endorf, *University of Cincinnati*
F. Paul Esposito, *University of Cincinnati*
Jerry Finkelstein, *San Jose State University*
Lev Gasparov, *University of North Florida*
Brian Geislinger, *Gadsden State Community College*
Corey Gerving, *United States Military Academy*
Robert H. Good, *California State University-Hayward*
Michael Gorman, *University of Houston*
Benjamin Grinstein, *University of California, San Diego*
John B. Gruber, *San Jose State University*
Ann Hanks, *American River College*
Randy Harris, *University of California-Davis*
Samuel Harris, *Purdue University*
Harold B. Hart, *Western Illinois University*
Rebecca Hartzler, *Seattle Central Community College*
Kevin Hope, *University of Montevallo*
John Hubisz, *North Carolina State University*
Joey Huston, *Michigan State University*
David Ingram, *Ohio University*
Shawn Jackson, *University of Tulsa*
Hector Jimenez, *University of Puerto Rico*
Sudhakar B. Joshi, *York University*
Leonard M. Kahn, *University of Rhode Island*
Rex Joyner, *Indiana Institute of Technology*
Michael Kalb, *The College of New Jersey*
Richard Kass, *The Ohio State University*
M.R. Khoshbin-e-Khoshnazar, *Research Institution for Curriculum Development and Educational Innovations (Tehran)*
Sudipa Kirtley, *Rose-Hulman Institute*
Leonard Kleinman, *University of Texas at Austin*
Craig Kletzing, *University of Iowa*

- Peter F. Koehler, *University of Pittsburgh*
Arthur Z. Kovacs, *Rochester Institute of Technology*
Kenneth Krane, *Oregon State University*
Hadley Lawler, *Vanderbilt University*
Priscilla Laws, *Dickinson College*
Edbertho Leal, *Polytechnic University of Puerto Rico*
Vern Lindberg, *Rochester Institute of Technology*
Peter Loly, *University of Manitoba*
Stuart Loucks, *American River College*
Laurence Lurio, *Northern Illinois University*
James MacLaren, *Tulane University*
Ponn Maheswaranathan, *Winthrop University*
Andreas Mandelis, *University of Toronto*
Robert R. Marchini, *Memphis State University*
Andrea Markelz, *University at Buffalo, SUNY*
Paul Marquard, *Caspar College*
David Marx, *Illinois State University*
Dan Mazilu, *Washington and Lee University*
Jeffrey Colin McCallum, *The University of Melbourne*
Joe McCullough, *Cabrillo College*
James H. McGuire, *Tulane University*
David M. McKinstry, *Eastern Washington University*
Jordon Morelli, *Queen's University*
Eugene Mosca, *United States Naval Academy*
Carl E. Mungan, *United States Naval Academy*
Eric R. Murray, *Georgia Institute of Technology, School of Physics*
James Napolitano, *Rensselaer Polytechnic Institute*
Amjad Nazzal, *Wilkes University*
Allen Nock, *Northeast Mississippi Community College*
Blaine Norum, *University of Virginia*
Michael O'Shea, *Kansas State University*
Don N. Page, *University of Alberta*
Patrick Papin, *San Diego State University*
Kiumars Parvin, *San Jose State University*
Robert Pelcovits, *Brown University*
Oren P. Quist, *South Dakota State University*
Elie Riachi, *Fort Scott Community College*
Joe Redish, *University of Maryland*
Andrew Resnick, *Cleveland State University*
Andrew G. Rinzler, *University of Florida*
Timothy M. Ritter, *University of North Carolina at Pembroke*
Dubravka Rupnik, *Louisiana State University*
Robert Schabinger, *Rutgers University*
Ruth Schwartz, *Milwaukee School of Engineering*
Thomas M. Snyder, *Lincoln Land Community College*
Carol Strong, *University of Alabama at Huntsville*
Anderson Sunda-Meya, *Xavier University of Louisiana*
Dan Styer, *Oberlin College*
Nora Thornber, *Raritan Valley Community College*
Frank Wang, *LaGuardia Community College*
Keith Wanser, *California State University Fullerton*
Robert Webb, *Texas A&M University*
David Westmark, *University of South Alabama*
Edward Whittaker, *Stevens Institute of Technology*
Suzanne Willis, *Northern Illinois University*
Shannon Willoughby, *Montana State University*
Graham W. Wilson, *University of Kansas*
Roland Winkler, *Northern Illinois University*
William Zacharias, *Cleveland State University*
Ulrich Zurcher, *Cleveland State University*