



Numerical Methods for Scientific Computing

By J.H. Heinbockel

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Numerical Methods for Scientific Computing is an introduction to numerical methods and analysis techniques that can be used to solve a variety of complicated engineering and scientific problems. The material is suitable for upper level college undergraduates or beginning graduate students. There is more than enough material for a two semester course in numerical methods and analysis for mathematicians, engineers, physicists, chemistry and science majors.

Chapter one reviews necessary background prerequisite material. The chapter two illustrates techniques for finding roots of equations. Chapter three studies solution methods applicable for handling linear and nonlinear systems of equations. Chapter four introduces interpolation and approximation techniques. The chapter five investigates curve fitting using least squares and linear regression. The chapter six presents the topics of difference equations and Z-transforms. The chapter seven concentrates on numerical differentiation and integration methods. Chapter eight examines numerical solution techniques for solving ordinary differential equations and chapter nine considers numerical solution techniques for solving linear partial differential equations. The chapter ten develops Monte Carlo techniques for simulating and analyzing complex systems. The final chapter eleven presents parallel computing considerations together with selected miscellaneous topics. 507pp.

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Editorial Review

About the Author

Dr. John H. Heinbockel is Professor Emeritus of Mathematics and Statistics from Old Dominion University, Norfolk, Virginia. He received his Ph.D. in applied mathematics from North Carolina State University in 1964. He joined Old Dominion University in 1967 and since then has taught a variety of mathematics courses at both the undergraduate and graduate level. He has been the principal investigator on many research grants. During this time he has produced numerous technical papers in the areas of applied mathematics.

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