

## C And Object Oriented Numeric Computing For Scientists And Engineers

In older times, classic procedure-oriented programming was used to solve real-world problems by fitting them in a few, predetermined data types. However, with the advent of object-oriented programming, models could be created for real-life systems. With the concept gaining popularity, its field of research and application has also grown to become one of the major disciplines of software development. With Object-Oriented Programming with C++, the authors offer an in- depth view of this concept with the help of C++, right from its origin to real programming level. With a major thrust on control statements, structures and functions, pointers, polymorphism, inheritance and reusability, file and exception handling, and templates, this book is a resourceful cache of programs-bridging the gap between theory and application. To make the book student- friendly, the authors have supplemented difficult topics with illustrations and programs. Put forth in a lucid language and simple style to benefit all types of learner, Object-Oriented Programming with C++ is packaged with review questions for self-learning.

This book is an easy, concise but fairly complete introduction to ISO/ANSI C++ with special emphasis on object-oriented numeric computation. A user-defined numeric linear algebra library accompanies the book and can be downloaded from the web.

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Finally, a great introduction to ANCI C++ for working programmers! Lippmann--who worked under the leadership of Bjarne Stroustrup, wrote the classic "C++ Primer", and now works as a C++ programmer at DreamWorks--teaches programmers exactly what they need to know to get immediate results. From start to finish, each concept and technique is presented through real programs designed to solve the problems C++ programmers are most likely to encounter.

The revised edition of Object-Oriented Programming with C++ has become more comprehensive with the inclusion of several topics. Like its previous edition, it provides an in-depth coverage of basic, as well as advanced concepts of object-oriented programming such as encapsulation, abstraction, inheritance, polymorphism, dynamic binding, templates, exception handling, streams, and Standard Template Library (STL) and their implementation through C++. Besides, the revised edition includes a chapter on multithreading. The book meets the requirements of students enrolled in various courses at undergraduate and postgraduate levels, including BTech, BE, BCA, BSc, MSc, and MCA. It is also useful for software developers who wish to expand their knowledge of C++. New in This Edition • Inclusion of topics like empty class, anonymous objects, recursive constructors and object slicing. • A chapter on multithreading explaining how concurrency is implemented in C++. Key Features • Presentation for easy grasp through chapter objectives, suitable tables, diagrams and programming examples. • Notes and key points provided to make the reader self-

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sufficient. • Examination-oriented approach through objective and descriptive questions at the end of each chapter to help students in the preparation for annual and semester tests

Develop the strong programming skills needed for professional success with Farrell's MICROSOFT VISUAL C# 2017: AN INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING, 7E. Approachable examples and a clear, straightforward style help readers build a solid understanding of both structured and object-oriented programming concepts. You Users master critical principles and techniques that easily transfer to other programming languages. This new edition incorporates the most recent versions of both C# and Visual Studio 2017 to ensure readers have the contemporary skills required in business today. Short You Do It hands-on features and a variety of new debugging exercises, programming exercises, and running case studies help users prepare for success in today's programming environment. Discover the latest tools and expertise for programming success in this new edition. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

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Science & Business Media

Move into iOS development by getting a firm grasp of its fundamentals, including the Xcode 9 IDE, Cocoa Touch, and the latest version of Apple's acclaimed programming

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language, Swift 4. With this thoroughly updated guide, you'll learn the Swift language, understand Apple's Xcode development tools, and discover the Cocoa framework. Explore Swift's object-oriented concepts Become familiar with built-in Swift types Dive deep into Swift objects, protocols, and generics Tour the lifecycle of an Xcode project Learn how nibs are loaded Understand Cocoa's event-driven design Communicate with C and Objective-C Once you master the fundamentals, you'll be ready to tackle the details of iOS app development with author Matt Neuburg's companion guide, Programming iOS 12.

Which comes first, learning object-oriented design or programming in C++? The authors present an object-oriented approach at the outset as the best way to learn introductory programming concepts. C++ doesn't have to be the top hierarchical level at the end of a programming journey. The object-oriented features of C++ are used as an appropriate foundation for learning to program.

"There are few books that show how to build programs of any kind. One common theme is compiler building, and there are shelves full of them. There are few others. It's an area, or a void, that needs filling. this book does a great job of showing how to build numerical analysis programs." -David N. Smith, IBM T J Watson Research Center

Numerical methods naturally lend themselves to an object-oriented approach.

Mathematics builds high- level ideas on top of previously described, simpler ones. Once a property is demonstrated for a given concept, it can be applied to any new concept

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sharing the same premise as the original one, similar to the ideas of reuse and inheritance in object-oriented (OO) methodology. Few books on numerical methods teach developers much about designing and building good code. Good computing routines are problem-specific. Insight and understanding are what is needed, rather than just recipes and black box routines. Developers need the ability to construct new programs for different applications. Object-Oriented Implementation of Numerical Methods reveals a complete OO design methodology in a clear and systematic way. Each method is presented in a consistent format, beginning with a short explanation and following with a description of the general OO architecture for the algorithm. Next, the code implementations are discussed and presented along with real-world examples that the author, an experienced software engineer, has used in a variety of commercial applications. Features: Reveals the design methodology behind the code, including design patterns where appropriate, rather than just presenting canned solutions. Implements all methods side by side in both Java and Smalltalk. This contrast can significantly enhance your understanding of the nature of OO programming languages. Provides a step-by-step pathway to new object-oriented techniques for programmers familiar with using procedural languages such as C or Fortran for numerical methods. Includes a chapter on data mining, a key application of numerical methods. This compact book presents a clear and thorough introduction to the object-oriented paradigm using the C++ language. It introduces the readers to various C++ features

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that support object-oriented programming (OOP) concepts. In an easy-to-comprehend format, the text teaches how to start and compile a C++ program and discusses the use of C++ in OOP. The book covers the full range of object-oriented topics, from the fundamental features through classes, inheritance, polymorphism, template, exception handling and standard template library. KEY FEATURES • Includes several pictorial descriptions of the concepts to facilitate better understanding. • Offers numerous class-tested programs and examples to show the practical application of theory. • Provides a summary at the end of each chapter to help students in revising all key facts. The book is designed for use as a text by undergraduate students of engineering, undergraduate and postgraduate students of computer applications, and postgraduate students of management.

Move into iOS development by getting a firm grasp of its fundamentals, including the Xcode 9 IDE, Cocoa Touch, and the latest version of Apple's acclaimed programming language, Swift 4. With this thoroughly updated guide, you'll learn the Swift language, understand Apple's Xcode development tools, and discover the Cocoa framework. Explore Swift's object-oriented concepts Become familiar with built-in Swift types Dive deep into Swift objects, protocols, and generics Tour the lifecycle of an Xcode project Learn how nibs are loaded Understand Cocoa's event-driven design Communicate with C and Objective-C In this edition, catch up on the latest iOS programming features. Multiline strings and improved dictionaries Object serialization Key paths and key-value

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observing Expanded git integration Code refactoring And more!

Move into iOS development by getting a firm grasp of its fundamentals, including the Xcode 13 IDE, Cocoa Touch, and the latest version of Apple's acclaimed programming language, Swift 5.5. With this thoroughly updated guide, you'll learn the Swift language, understand Apple's Xcode development tools, and discover the Cocoa framework.

Explore Swift's object-oriented concepts Become familiar with built-in Swift types Dive deep into Swift objects, protocols, and generics Tour the life cycle of an Xcode project Learn how nibs are loaded Understand Cocoa's event-driven design Communicate with C and Objective-C In this edition, catch up on the latest iOS programming features: Structured concurrency: async/await, tasks, and actors Swift native formatters and attributed strings Lazy locals and throwing getters Enhanced collections with the Swift Algorithms and Collections packages Xcode tweaks: column breakpoints, package collections, and Info.plist build settings Improvements in Git integration, localization, unit testing, documentation, and distribution And more!

Learn Objective-C for Java Developers will guide experienced Java developers into the world of Objective-C. It will show them how to take their existing language knowledge and design patterns and transfer that experience to Objective-C and the Cocoa runtime library. This is the express train to productivity for every Java developer who has dreamed of developing for Mac OS X or iPhone, but felt that Objective-C was too intimidating. So hop on and enjoy the ride! Provides a translation service that turns

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Java problem-solving skills into Objective-C solutions Allows Java developers to leverage their existing experience and quickly launch themselves into a new domain Takes the risk out of learning Objective-C

Accurate and efficient computer algorithms for factoring matrices, solving linear systems of equations, and extracting eigenvalues and eigenvectors. Regardless of the software system used, the book describes and gives examples of the use of modern computer software for numerical linear algebra. It begins with a discussion of the basics of numerical computations, and then describes the relevant properties of matrix inverses, factorisations, matrix and vector norms, and other topics in linear algebra. The book is essentially self-contained, with the topics addressed constituting the essential material for an introductory course in statistical computing. Numerous exercises allow the text to be used for a first course in statistical computing or as supplementary text for various courses that emphasise computations.

This book is the second edition of M.T. Somashekara's earlier book titled Programming in C++, under the new title Object-Oriented Programming with C++. In consonance with the new title, two chapters—one explaining the concepts of object-oriented programming and the other on object oriented software development—have been added, respectively, at the beginning and end of the book. Substantial improvements have been effected in all chapters on C++. The book also carries a new chapter titled Standard Template Library. The book covers the C++ language thoroughly, from basic concepts through

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advanced topics such as encapsulation, polymorphism, inheritance, and exception handling. It presents C++ in a pedagogically sound way, giving many program examples to highlight the features and benefits of each of its concepts. The book is suitable for all engineering and science students including the students of computer applications for learning the C++ language from the first principles. **KEY FEATURES :** Logical flow of concepts starting from the preliminary topics to the major topics. Programs for each concept to illustrate its significance and scope. Complete explanation of each program with emphasis on its core segment. Chapter-end summary, review questions and programming exercises. Exhaustive glossary of programming terms.

Move into iOS development by getting a firm grasp of its fundamentals, including the Xcode IDE, the Cocoa Touch framework, and Swift—Apple’s new programming language. With this thoroughly updated guide, you’ll learn Swift’s object-oriented concepts, understand how to use Apple’s development tools, and discover how Cocoa provides the underlying functionality iOS apps need to have. Explore Swift’s object-oriented concepts: variables and functions, scopes and namespaces, object types and instances Become familiar with built-in Swift types such as numbers, strings, ranges, tuples, Optionals, arrays, and dictionaries Learn how to declare, instantiate, and customize Swift object types—enums, structs, and classes Discover powerful Swift features such as protocols and generics Tour the lifecycle of an Xcode project from

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inception to App Store Create app interfaces with nibs and the nib editor, Interface Builder Understand Cocoa's event-driven model and its major design patterns and features Find out how Swift communicates with Cocoa's C and Objective-C APIs Once you master the fundamentals, you'll be ready to tackle the details of iOS app development with author Matt Neuburg's companion guide, Programming iOS 8. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Especially designed to teach object oriented programming using the C++ language to those with no previous experience of programming. Throughout the text many straightforward examples are used to introduce and illustrate new techniques and language features. Each chapter starts with learning objectives and concludes with a number of exercises. Solutions for all exercises are given in an appendix.

This volume contains the Proceedings of the International Symposium on Computing in Object-Oriented Parallel Environments (ISCOPE '98), held at Santa Fe, New Mexico, USA on December 8-11, 1998. ISCOPE is in its second year, and continues to grow both in attendance and in the diversity of the subjects covered. ISCOPE'97 and its predecessor conferences focused more narrowly on scientific computing in the high-performance arena. ISCOPE '98 retains this

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emphasis, but has broadened to include discrete-event simulation, mobile computing, and web-based metacomputing. The ISCOPE '98 Program Committee received 39 submissions, and accepted 10 (26%) as Regular Papers, based on their excellent content, maturity of development, and likelihood for widespread interest. These 10 are divided into three technical categories. Applications: The first paper describes an approach to simulating advanced nuclear power reactor designs that incorporates multiple local solution methods and a natural extension to parallel execution. The second paper discusses a Time Warp simulation kernel that is highly configurable and portable. The third gives an account of the development of software for simulating high-intensity charged particle beams in linear particle accelerators, based on the POOMA framework, that shows performance considerably better than an HPF version, along with good parallel speedup.

Textbook and reference work on the application of C++ in science and engineering.

Move into iOS development by getting a firm grasp of its fundamentals, including the Xcode 10 IDE, Cocoa Touch, and the latest version of Apple's acclaimed programming language, Swift 5. With this thoroughly updated guide, you'll learn the Swift language, understand Apple's Xcode development tools, and discover

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the Cocoa framework. Explore Swift's object-oriented concepts Become familiar with built-in Swift types Dive deep into Swift objects, protocols, and generics Tour the lifecycle of an Xcode project Learn how nibs are loaded Understand Cocoa's event-driven design Communicate with C and Objective-C Once you master the fundamentals, you'll be ready to tackle the details of iOS app development with author Matt Neuburg's companion guide, Programming iOS 13.

This is the digital version of the printed book (Copyright 2007). Virtually all business, scientific, and engineering applications are heavily reliant on numeric data items. C++ and Java offer object-oriented programmers unique flexibility and control over the computations required within such applications. However, most books on object-oriented programming gloss over such numeric data items, emphasizing instead one-dimensional containers or collections and components of the graphical user interface. Object-Oriented Computation in C++ and Java fills the gap left by such books. Drawing on more than twenty years' experience as a software developer, tester, consultant, and professor, Conrad Weisert shows readers how to use numeric objects effectively. Not limited to any language or methodology, the concepts and techniques discussed in this book are entirely independent of one's choice of design and coding methodology. Practitioners of Extreme Programming, UML-driven design, agile methods, incremental

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development, and so on will all develop these same data classes. Whether you are a seasoned professional or an advanced computer science student, this book can teach you techniques that will improve the quality of your programming and the efficiency of your applications. The exercises (and answers) presented in this book will teach you new ways to implement the computational power of C++, Java, and numeric data items. Topics include taxonomy of data types developing and using object-oriented classes for numeric data design patterns for commonly occurring numeric data types families of interacting numeric data types choosing efficient and flexible internal data representations techniques for exploiting pattern reuse in C++ conventions for arithmetic operations in Java numeric vectors and matrices

The tool for visualization is Microsoft Visual C++. This popular software has the standard C++ combined with the Microsoft Foundation Classes (MFC) libraries for Windows visualization. This book explains how to create a graph interactively, solve problems in graph theory with minimum number of C++ codes, and provide friendly interfaces that makes learning the topics an interesting one. Each topic in the book comes with working Visual C++ codes which can easily be adapted as solutions to various problems in science and engineering.

Provides aspiring quant developers with the numerical techniques and

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programming skills needed in quantitative finance. No programming background required.

Why Another Book on c++ and why Programming and Graphics? Anyone who has browsed through the 'Computing' section of a bookshop (assuming it has one) will not need much convincing that there are a lot of C++ books out there. So why add yet another to the shelf! This book attempts to introduce you to the C++ language via computer graphics because the object-oriented programming features of C++ naturally lend themselves to graphics. Thus, this book is based around a central theme: computer graphics and the development of 'real' object-oriented tools for graphical modelling. This approach is adopted (as opposed to learning by small, unrelated, often hypothetical, examples) because I didn't want to introduce C++ as a collection of language features. While introducing the syntax and features of C++, it is just as important to demonstrate simultaneously the reason for such features and when to apply them - in other words, language and design are given equal priority. Also, a key objective in writing this book is to present you with a comprehensive introductory text on programming in the C++ language.

Performance Optimization of Numerically Intensive Codes offers a comprehensive, tutorial-style, hands-on, introductory and intermediate-level

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treatment of all the essential ingredients for achieving high performance in numerical computations on modern computers. The authors explain computer architectures, data traffic and issues related to performance of serial and parallel code optimization exemplified by actual programs written for algorithms of wide interest. The unique hands-on style is achieved by extensive case studies using realistic computational problems. The performance gain obtained by applying the techniques described in this book can be very significant. The book bridges the gap between the literature in system architecture, the one in numerical methods and the occasional descriptions of optimization topics in computer vendors' literature. It also allows readers to better judge the suitability of certain computer architecture to their computational requirements. In contrast to standard textbooks on computer architecture and on programming techniques the book treats these topics together at the level necessary for writing high-performance programs. The book facilitates easy access to these topics for computational scientists and engineers mainly interested in practical issues related to efficient code development.

This edited survey book consists of 20 chapters showing application of Clifford algebra in quantum mechanics, field theory, spinor calculations, projective geometry, Hypercomplex algebra, function theory and crystallography. Many

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examples of computations performed with a variety of readily available software programs are presented in detail.

In this much-expanded second edition, author Yair Shapira presents new applications and a substantial extension of the original object-oriented framework to make this popular and comprehensive book even easier to understand and use. It not only introduces the C and C++ programming languages, but also shows how to use them in the numerical solution of partial differential equations (PDEs). The book leads readers through the entire solution process, from the original PDE, through the discretization stage, to the numerical solution of the resulting algebraic system. The high level of abstraction available in C++ is particularly useful in the implementation of complex mathematical objects, such as unstructured mesh, sparse matrix, and multigrid hierarchy, often used in numerical modeling. The well-debugged and tested code segments implement the numerical methods efficiently and transparently in a unified object-oriented approach.

A visual, interdisciplinary approach to solving problems in numerical methods Computing for Numerical Methods Using Visual C++ fills the need for a complete, authoritative book on the visual solutions to problems in numerical methods using C++. In an age of boundless research, there is a need for a programming

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language that can successfully bridge the communication gap between a problem and its computing elements through the use of visualization for engineers and members of varying disciplines, such as biologists, medical doctors, mathematicians, economists, and politicians. This book takes an interdisciplinary approach to the subject and demonstrates how solving problems in numerical methods using C++ is dominant and practical for implementation due to its flexible language format, object-oriented methodology, and support for high numerical precisions. In an accessible, easy-to-follow style, the authors cover: Numerical modeling using C++ Fundamental mathematical tools MFC interfaces Curve visualization Systems of linear equations Nonlinear equations Interpolation and approximation Differentiation and integration Eigenvalues and Eigenvectors Ordinary differential equations Partial differential equations This reader-friendly book includes a companion Web site, giving readers free access to all of the codes discussed in the book as well as an equation parser called "MyParser" that can be used to develop various numerical applications on Windows. Computing for Numerical Methods Using Visual C++ serves as an excellent reference for students in upper undergraduate- and graduate-level courses in engineering, science, and mathematics. It is also an ideal resource for practitioners using Microsoft Visual C++.

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Move into iOS development by getting a firm grasp of its fundamentals, including the Xcode 12 IDE, Cocoa Touch, and the latest version of Apple's acclaimed programming language, Swift 5.3. With this thoroughly updated guide, you'll learn the Swift language, understand Apple's Xcode development tools, and discover the Cocoa framework. Become familiar with built-in Swift types Dive deep into Swift objects, protocols, and generics Tour the life cycle of an Xcode project Learn how nibs are loaded Understand Cocoa's event-driven design Communicate with C and Objective-C In this edition, catch up on the latest iOS programming features: Multiple trailing closures Code editor document tabs New Simulator features Resources in Swift packages Logging and testing improvements And more! Once you master the fundamentals, you'll be ready to tackle the details of iOS app development with author Matt Neuburg's companion guide, *Programming iOS 14*.

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This easy-to-read textbook/reference presents an essential guide to object-oriented C++ programming for scientific computing. With a practical focus on

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learning by example, the theory is supported by numerous exercises. Features: provides a specific focus on the application of C++ to scientific computing, including parallel computing using MPI; stresses the importance of a clear programming style to minimize the introduction of errors into code; presents a practical introduction to procedural programming in C++, covering variables, flow of control, input and output, pointers, functions, and reference variables; exhibits the efficacy of classes, highlighting the main features of object-orientation; examines more advanced C++ features, such as templates and exceptions; supplies useful tips and examples throughout the text, together with chapter-ending exercises, and code available to download from Springer.

Since the dawn of computing, the quest for a better understanding of Nature has been a driving force for technological development. Groundbreaking achievements by great scientists have paved the way from the abacus to the supercomputing power of today. When trying to replicate Nature in the computer's silicon test tube, there is need for precise and computable process descriptions. The scientific fields of Mathematics and Physics provide a powerful vehicle for such descriptions in terms of Partial Differential Equations (PDEs). Formulated as such equations, physical laws can become subject to computational and analytical studies. In the computational setting, the equations can be discretized for efficient solution on a computer, leading to valuable tools for simulation of

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natural and man-made processes. Numerical solution of PDE-based mathematical models has been an important research topic over centuries, and will remain so for centuries to come. In the context of computer-based simulations, the quality of the computed results is directly connected to the model's complexity and the number of data points used for the computations. Therefore, computational scientists tend to ?ll even the largest and most powerful computers they can get access to, either by increasing the size of the data sets, or by introducing new model terms that make the simulations more realistic, or a combination of both. Today, many important simulation problems can not be solved by one single computer, but calls for parallel computing.

And Conclusion  
Chapter 2. Functions; Function Parameters and Return Value; Void Return Type and Parameters; Function Signature; External Parameter Names; Overloading; Default Parameter Values; Variadic Parameters; Ignored Parameters; Modifiable Parameters; Function In Function; Recursion; Function As Value; Anonymous Functions; Define-and-Call; Closures; How Closures Improve Code; Function Returning Function; Closure Setting a Captured Variable; Closure Preserving Its Captured Environment; Curried Functions; Chapter 3. Variables and Simple Types; Variable Scope and Lifetime.

Using object-oriented terminology from the start, *Object-Oriented Programming Using C++, Fourth Edition*, will provide readers with a solid foundation in C++ programming. Like its predecessors, the fourth edition uses clear, straightforward examples to teach

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both the syntax of the C++ language and sound programming principles. It begins with an overview of object-oriented programming and C++, and then builds upon this knowledge to teach increasingly complex concepts, such as inheritance, templates, handling exceptions, and advanced input and output. Aimed at providing readers with the most current programming knowledge, this edition has been updated to reflect the latest software, Visual C++ 2008. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

This fully revised and indispensable edition of Object-Oriented Programming with C++ provides a sound appreciation of the fundamentals and syntax of the language, as well as of various concepts and their applicability in real-life problems. Emphasis has been laid on the reusability of code in object-oriented programming and how the concepts of class, objects, inheritance, polymorphism, friend functions, and operator overloading are all geared to make the development and maintenance of applications easy, convenient and economical.

C# is a modern, object-oriented language that enables programmers to quickly build a wide range of applications for the new Microsoft .NET platform, which provides tools and services that fully exploit both computing and communications. Learning to Program the Object-Oriented Way with C# presents an introductory guide to this hot topic. The authors use a practice-based approach supported by lots of examples of increasing complexity and frequent graded exercises, which are available online.

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-Introduces an approach to learning programming based on the use of object orientation from day one. -Includes many worked examples, the code and solution to which are available online. -The book is being technically reviewed and approved by Microsoft. -One of the first introductory textbooks on C# and object orientation - based on the final release version at the beginning of 2002. -Suitable for courses in introductory programming.

There are many books on the use of numerical methods for solving engineering problems and for modeling of engineering artifacts. In addition there are many styles of such presentations ranging from books with a major emphasis on theory to books with an emphasis on applications. The purpose of this book is hopefully to present a somewhat different approach to the use of numerical methods for engineering applications. Engineering models are in general nonlinear models where the response of some appropriate engineering variable depends in a nonlinear manner on the application of some independent parameter. It is certainly true that for many types of engineering models it is sufficient to approximate the real physical world by some linear model. However, when engineering environments are pushed to extreme conditions, nonlinear effects are always encountered. It is also such extreme conditions that are of major importance in determining the reliability or failure limits of engineering systems. Hence it is essential that engineers have a toolbox of modeling techniques that can be used to model nonlinear engineering systems. Such a set of basic numerical methods

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is the topic of this book. For each subject area treated, nonlinear models are incorporated into the discussion from the very beginning and linear models are simply treated as special cases of more general nonlinear models. This is a basic and fundamental difference in this book from most books on numerical methods.

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