

# Instructor's Summary for *Murach's Mainframe COBOL*

This summary provides information about the course that you can teach with *Murach's Mainframe COBOL*, about the book itself, about the student materials that can be downloaded from our web site, about the Instructor's CD, and about what you need to do if you're upgrading from *Murach's Structured COBOL*. We think that this summary provides some useful information, so we hope that you'll take a few minutes to read it. If you prefer, though, you can check the contents that follow and read just the topics that are of interest to you.

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# About the course

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The topics that follow give you information about the course components and the way you can use these components in an effective course.

## What the course components are

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The primary component of this course is *Murach's Mainframe COBOL*, which is the latest edition of what has been the best-selling book for professional COBOL programmers since the late 1970s. To make it easy for you to use this book for a COBOL course, we also provide these components:

- A downloadable Student Workbook that includes behavioral objectives, chapter summaries, terms lists, and student projects that force the students to apply what they've learned by developing complete programs.
- A downloadable Net Express tutorial for students who are going to use the University Edition of Micro Focus Net Express for practicing on their own PCs.
- Downloadable student exercises for use with Net Express plus the starting programs and data that are needed for doing the exercises. These exercises are carefully designed to give the students the most programming practice in the least time.
- An Instructor's CD that contains everything else you need for running a course including PowerPoint slides, multiple-choice tests, solutions to the exercises, solutions to the projects, and more.

The students can download the first three components from our web site, but they are also included on the Instructor's CD. As you read through the rest of this document, you'll learn more about these components.

## What types of courses the book can be used for

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*Murach's Mainframe COBOL* is designed to teach a person with no programming experience how to design and develop COBOL programs the way the best professionals develop them. To say that another way, a person who completes the entire book should have at least the skills of an entry-level programmer in industry. That objective is achieved if the student reads the entire book, does the exercises, and does a reasonable selection of the student projects.

This means that you can use the book for an introductory, intermediate, or advanced course. As you will see, the book works for students with no previous programming experience, and the book works well for students who have experience with another language. Also, because of the book's unique modular organization, you can decide which chapters you want to include in your course and what sequence you want to teach them.

## Why it's easy to customize your course

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Section 1 of *Murach's Mainframe COBOL* presents a complete subset of COBOL that consists of all the skills your students need for developing report-preparation programs including structured design and structured coding. When your students complete the six chapters in this section, they have a clear view of what COBOL programming is and what they need to learn to become proficient at it.

Then, to give the instructor as much control as possible, the remaining sections and chapters in the book are designed as independent instructional modules. This means that you don't have to teach them in sequence. If, for example, you want to teach table handling next, you can skip to chapter 10. If you want to teach more about working with sequential files, you can skip to chapters 12 and 13. And if you want to teach how to compile and test a program on an IBM mainframe, you can skip to chapter 18.

We refer to this as "modular organization," and this is summarized in the table that follows. This table shows that the prerequisite for sections 2, 3, and 4 is just section 1. It also shows that the chapters in sections 2 and 4 can be taught in whatever sequence you prefer, but the chapters in section 3 should be taught in sequence.

Section	Title	Prerequisites	Sequential or random
1	The essence of COBOL programming	None	Sequential
2	Other COBOL essentials	Section 1	Random
3	COBOL for working with files	Section 1	Sequential, but you can skip chapter 15 (relative files)
4	The IBM mainframe environment for COBOL	Section 1	Random

One of the options that this gives you is to teach a one-semester COBOL course that focuses on file handling, which is a COBOL strength. To do that, you can teach just the chapters in sections 1 and 3 (plus any others that you have time for). That will give your students a clear idea of how COBOL differs from languages like Java, Visual Basic, or C# and why COBOL will continue to be used as a transaction processing language for many years to come. This is a completely different view of programming than your students get from Java, VB, or C# courses, so it will give them some needed perspective.

## What compilers you can use with the book

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Although *Murach's Mainframe COBOL* is designed to teach COBOL the way it's used on IBM mainframes, the first three sections of the book present standard 1985 COBOL (the standard that's currently supported by IBM mainframe compilers). That means that our book can be used with any compiler that supports those standards (and they all do). You just need to supply the operational details for compiling and testing COBOL programs on your lab computer.

## What compiler we recommend for student PC use and how your students can get it

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As we developed this book, we tried to find the best PC compiler that students could use for practicing on their own PCs. Eventually, we settled on the University Edition of Micro Focus Net Express for two reasons. First, it is a terrific product for learning how to develop COBOL programs. Second, the current version works with Windows 2000 and Windows XP, and Micro Focus will probably continue to upgrade it for new Windows releases. In contrast, all other PC compilers were hard to use and hard to install, and we doubt that they'll be around two years from now.

To make it easy for your students to get the University Edition of Net Express, we offer a package that consists of our book plus software:

<b>ISBN</b>	<b>Description</b>	<b>Student Price</b>
978-1-890774-24-0	Murach's Mainframe COBOL (book only)	\$59.50
978-1-890774-40-0	Murach's Mainframe COBOL plus the University Edition of Net Express 5.0	\$144.50

In addition, because the user manual for Net Express is so bad, we're providing a downloadable tutorial that will make it easy for your students to use this product.

## About the book

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When you review *Murach's Mainframe COBOL*, it's pretty obvious what we tried to do. That is, we tried to present every COBOL skill as clearly and logically as possible. The topics that follow, though, present some thinking behind the book that may not be that obvious.

## Why our book presents IBM mainframe COBOL

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Today, 90% or more of all the COBOL programming is being done on IBM mainframes, and those programs in combination with CICS account for more transaction processing than all other types of programs on all other platforms. Beyond that, those programs are going to be maintained and enhanced for many years to come because no other platform has the power to support that level of transaction processing. For those reasons alone, it's unrealistic to treat COBOL in any other context.

In addition, though, most of the COBOL programs that were once running on other platforms have been replaced by new systems written in newer languages. Object-oriented COBOL has never gotten off the ground. And Fujitsu and Micro Focus are struggling to find some acceptance for their versions of .NET COBOL. That's why our book doesn't include chapters on object-oriented COBOL or .NET COBOL.

Keep in mind, however, that the current IBM compilers are based on the 1985 COBOL standards. As a result, our book can be used to teach COBOL with any compiler that supports those standards (and they all do). Then, to present COBOL in its proper context, you can teach selected chapters from the fourth section of the book ("The IBM mainframe environment for COBOL"). That will give your students the real-world perspective that's missing from other COBOL books.

## Why our structured design and coding methods are used in the real world

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In 1977, we published a book called *Structured Programming for the COBOL Programmer* by Paul Noll. It presented a cohesive set of methods for designing, coding, and testing structured COBOL programs. Paul had developed these methods as a training manager for Pacific Telephone. Then, after we published his book, he started a consulting career during which he taught his methods in COBOL shops throughout the country. Meanwhile, we continued to publish COBOL books that promoted and improved upon these methods.

Today, those methods are the most widely-used structured methods, and they've become an ad hoc standard in many COBOL shops. That's why we present these methods in *Murach's Mainframe COBOL*. In particular, our book presents the structure chart as the graphic documentation for program design, and it presents top-down coding and testing as the preferred way to develop programs. It also presents pseudocode as an occasional tool for planning the logic of critical paragraphs.

Please note, however, that our focus is on the design principles, not the graphic methods. In particular, we believe that an effective programmer needs to design each program from the top-down with one independent function in each module (or COBOL

paragraph), but it doesn't matter what graphics you use to get there. This focus is what distinguishes our structured methods from others.

In contrast, most competing books present design methods that simply aren't used in the real world. The long-time, best-selling textbook, for example, presents report-preparation programs that are driven by the Not At End clauses of Read statements. This is contrary to any reasonable principles of structured design, and it leads to serious problems as the complexity of a program increases.

## Why we don't use program flowcharts as a design method

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The short answer is that program flowcharts haven't been used in the real world for at least 25 years, for at least three reasons. First, programmers can understand the logic of pseudocode or COBOL code more easily than the logic of flowcharts. Second, the more complicated the logic, the more this is true. Third, it takes so long to draw flowcharts that they would be impractical even if the first two reasons weren't true.

From an instructional point of view, though, it's occasionally tempting to use a flowchart to show the logic of a Perform-Until or If-Else statement. In fact, we did that in figure 5-1 of *Murach's Mainframe COBOL*. On the other hand, we didn't include a flowchart for the Evaluate statement in figure 5-12 because the COBOL code is easier to understand than a flowchart would be.

## Why our book works so well for students who are taking COBOL as a first language

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Unlike other COBOL books, chapter 1 of *Murach's Mainframe COBOL* starts with a simple interactive program instead of a report-preparation program. This gets the students programming right away without all the added complexity of working with files. Then, chapter 2 shows the students how to compile and test their programs.

With this approach, the students are ready for report-preparation programs when they are introduced to them in chapter 3, and that chapter shows them how to develop a simple listing program with headings and a total line. From that point on, the students can build rapidly on what they've learned.

## Why our book works so well for students who are taking COBOL as a second language

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The approach that I've just described works equally well for students who are learning COBOL after they've learned a language like Java, Visual Basic, or C#. After just five chapters, these students can clearly see the differences between structured programming and object-oriented programming. They can see how easy it is to use COBOL for working with files, records, and fields. And if you jump to section 3 after section 1, your students will start to understand why COBOL will still be around 15 years from now.

In contrast, the leading COBOL textbook takes four chapters to show how to develop a program that lists the records in a file, with no headings and no total lines. At a pace like that, is it any wonder that a modern student is "bored" by COBOL?

# What the students can download from our web site

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To help your students get the most from our book, we provide three components that can be downloaded from our web site ([www.murach.com](http://www.murach.com)). Each downloadable is an executable file that expands into the folders and files that it contains.

## 8 of the book's programs and the data for running them

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To help your students understand how the complete programs in the book work, the first download contains 8 of the primary programs along with the files that the programs process. If your students are using the University Edition of Net Express on their own PCs, they can compile and run these programs without any changes. They can also step through the programs to see exactly how they work.

If your students are using some other PC compiler, they may have to relocate the files, change the file names, or change the system names in the programs. But once that's done, they should be able to compile and run the programs.

## The Student Workbook including the copy members and data for the student projects

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Because the book doesn't include the normal apparatus that you'll find in a college programming text, we've provided a downloadable Student Workbook that contains study aids like behavioral objectives, chapter summaries, and terms lists. This Workbook also includes student projects that require the students to develop complete programs from scratch. And this download includes the copy members and data files that the programs require.

As part of your course, you will probably assign several of the student projects that are presented in the Workbook. That is the surest test of whether a student has mastered the skills that are presented in the book.

## Our Net Express tutorial and exercises, plus the exercise starts and data

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For those students who are using the University Edition of Net Express, we've provided a downloadable PDF tutorial that shows how to use the Net Express IDE to compile, test, and debug the types of COBOL programs that are presented in our book. This document will save your students from a lot of frustration and will save you from a lot of questions, because the manual that comes with Net Express isn't of much use. In fact, we recommend that your students ignore the manual and use just our tutorial.

The second part of the downloadable is a PDF document that presents exercises that are designed to give the students a maximum amount of programming practice in a minimum of time. To make that possible, many of the exercises start from programs or partial programs. As a result, this downloadable also includes all the programs, partial programs, and data that are required by these exercises.

For instance, exercise 2-2 requires the sales tax program that is presented in chapter 1 so the student can compile and test it. Then, exercise 2-3 requires the same program with some compile-time and run-time errors built in so the student gets practice correcting these types of errors. Similarly, exercise 3-1 requires the program and data that's presented in chapter 3 so the student can compile and test that program. And exercise 3-2 requires the same program with some compile-time and run-time errors.

Later in the book, the exercises make use of partial programs that help the student focus on new coding skills. For instance, exercise 8-3 requires a partial program that gets user entries but doesn't process them. Then, this exercise asks the student to enhance the program so it calculates the user's age after the user enters a month, day, and year.

This use of partial programs in this way clearly improves training efficiency, and we haven't seen anything like it for other COBOL books. If possible, then, we recommend that your students use the University Edition of Net Express on their own PCs to get the most from our book. If you prefer that they use another compiler, though, please be aware that we offer a generic version of the exercises on the Instructor's CD that can be used with any compiler.

# What the Instructor's CD contains

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Simply stated, we have tried to include everything you need for running an effective COBOL course on the Instructor's CD for *Murach's Mainframe COBOL*. A complete summary follows.

## PowerPoint slides

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Because our book uses the paired-pages method of presentation, all of the critical information is presented in the figures. Then, in the PowerPoint slides, we present abridged versions of that information. That includes all of the charts, screens, diagrams, tables, and code that you may want to review in class, but it omits the details that are best left to the textbook. As a result, you can use the slides to review all of the skills that are presented in the book, especially those that your students have difficulty with. In addition, the slides for each chapter start with the objectives that are presented in the Student Workbook.

If you want to modify any of the PowerPoint slides, you should know that we prepared the slides by copying the Word text from our figures into PowerPoint. As a result, you can't use PowerPoint to modify the text in the normal way. Instead, you need to double-click on the text for a slide to open it up in Word, make modifications to the text in Word, and click outside the text to return to PowerPoint. If you try this, though, you'll see that it's an easy process. You can also use PowerPoint in the normal way to add slides, delete slides, or add your own presentation notes to the slides.

## Multiple-choice tests and answers

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To test comprehension, the Instructor's CD includes one multiple-choice test for each chapter in the book. These are carefully designed to test the skills that are described in the behavioral objectives that are in the Student Workbook. As a result, there are no tricks. If your students can do all of the skills that the objectives describe, they should be able to easily pass the tests.

In addition, the CD includes one multiple-choice test for each section in the book. These are simply combinations of the best items selected from the chapter tests (there aren't any new items). That way, you can easily test at the chapter or the section level. Because all of the tests are presented as Word documents, you can easily modify or enhance them to suit your requirements.

## Book programs and data

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To make it easy for you to review or demonstrate the complete programs that are presented in the book, they too are included on the Instructor's CD along with the required data files. Although most of these programs are also included as a student download, this lets you access all of the instructional materials from a single CD.

## The Student Workbook and the Net Express files

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Here again, to give you access to all the instructional materials from a single CD, we've put the downloadable Student Workbook and Net Express documents and files on the Instructor's CD. That way, you don't have to download anything.

## Objectives in Word

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In case you want to modify the behavioral objectives that are in the Student Workbook, the Instructor's CD consolidates them all in a single Word file. That way, you can add, delete, or modify our objectives to suit your purposes. You can then distribute the modified objectives to your students.

Incidentally, we prepared these objectives based on the principles presented by Robert F. Mager in his classic book, *Preparing Instructional Objectives*. If you study them, you can see that the first objectives for each chapter are what we refer to as *applied objectives*. These ask the students to apply what they've learned as they develop COBOL programs. These are the critical objectives of a programming course, and they are best tested by the exercises and student projects.

After the applied objectives for each chapter, you'll find what we refer to as *knowledge objectives*. These objectives define skills like identifying, describing, and explaining the required concepts, terms, and procedures. In general, all of the students should be able to do the knowledge objectives, even if they have trouble with the applied objectives.

## Student projects in Word

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In case you want to modify the student projects that are in the Student Workbook, they are also available as a single Word file on the Instructor's CD. That way, you can simplify or enhance the projects before you distribute and assign them.

## Generic exercises in Word

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The downloadable Net Express exercises include specific instructions for doing the required tasks using that IDE. If your students aren't using the University Edition of Net Express, though, you can have them do the generic exercises that are included on the Instructor's CD. In general, these get the same training results as the downloadable exercises, but without benefiting from the use of some of the special features of Net Express.

## Exercise solutions

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The Instructor's CD provides one set of solutions that works for both the Net Express exercises and the generic exercises. Then, you can present these solutions in class and compare them with the solutions that the students come up with. You can also compile and run the programs to demonstrate how they work. Since these solutions were developed for Net Express, though, you may have to change the system names if you're using a different compiler.

## Project solutions

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The Instructor's CD also provides all of the solutions to the student projects. Then, you can present them in class or compare them with the student solutions. And you can compile and run them to demonstrate how they work. Here again, the solutions were developed for Net Express so you may have to change the system names if you're using a different compiler.

# If you're upgrading from *Murach's Structured COBOL...*

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If you have been using *Murach's Structured COBOL* for your classes and are now faced with the prospect of upgrading to *Murach's Mainframe COBOL*, I'm happy to report that the transition should be easy for two reasons. First, we've made few changes to the book other than removing the material on Micro Focus Personal COBOL. Second, the only changes to the materials on the Instructor's CD are the ones that relate to the changes in the book. The topics that follow summarize these changes.

## Book changes

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The first 16 chapters (the ones that present COBOL) are essentially the same in both the old and the new books. That's why the transition to the new book should be an easy one. Beyond that, we've deleted two chapters from section 4 of the old book and added two new chapters to section 4 of the new book. A complete summary of the primary changes to the new book follows:

- We dropped the material on Personal COBOL from all of the chapters and replaced it with the downloadable Net Express tutorial.
- We dropped the apparatus at the ends of the chapters and replaced it with the downloadable Student Workbook.
- We dropped the exercises at the ends of the chapters and replaced them with the downloadable Net Express exercises and the generic exercises that are on the Instructor's CD.
- We replaced old chapter 2 with a new, generic version of "How to compile, test, and debug a COBOL program." Then, the Net Express tutorial shows how to do that with Net Express, and chapter 18 shows how to do that on a mainframe.
- We dropped old chapter 17 called "How to develop interactive programs with Micro Focus Personal COBOL."
- We dropped old chapter 22 called "Introduction to object-oriented COBOL."
- We added a new chapter 17 called "Introduction to IBM mainframes," which gives a great introduction to the complexity of this platform.
- We added a new chapter 19 called "How to use Access Method Services for VSAM files" because this is an essential skill for mainframe programmers.
- We dropped appendix A, the student projects, and put them into the downloadable Student Workbook.
- We dropped the book's CD and made all of its files available as downloads from our web site.

Beyond that, we made some minor updates and improvements that include these:

- We've updated the platform and compiler information in figures 1-1 and 1-2 of chapter 1.

- We added a figure 4-17 to chapter 4 that summarizes the differences between structured programming and object-oriented programming. This should be of interest to students who have already learned how to use an OO language.
- We added a figure 5-21 to chapter 5 that presents a modern COBOL coding style (although many COBOL programmers still use the old coding style).
- We simplified chapter 6 (“Other ways to define, move, and initialize fields) so it emphasizes the features that are used with IBM mainframe COBOL (and we moved this chapter into section 1 because it should be part of the basic programming subset).
- We rearranged and improved chapter 7 (“How to use arithmetic statements and intrinsic functions”) because one of our adopting instructors pointed out some problems with the old chapter.

As you review these changes, I think you’ll see that they will have little effect on what you’ve been teaching, unless you’ve been teaching old chapter 17 or 22. In fact, we hope that these changes will actually make your job easier by separating mainframe COBOL (what’s in the book) from the details of PC COBOL (what’s in the Net Express tutorial).

## Instructor’s CD changes

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The only changes we’ve made to the materials on the Instructor’s CD are the ones that were forced by the changes to the book. These consist of:

- Changes to the PowerPoint slides that reflect the changes to the text.
- Changes to the multiple-choice tests that reflect the changes to the text.

Beyond that, we’ve made a few improvements to the Net Express and generic exercises based on discoveries that we made as we tested them one last time.

What this means is that you should only have to make minimal changes to the instructor’s materials that you’ve been using with *Murach’s Structured COBOL* to adapt them to the new book. In fact, if you’ve customized our slides, tests, and projects, you may not want to change them at all. If you haven’t customized them, though, it’s probably best to switch to the new slides and tests.

## Your comments, please!

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If you have any comments about or suggestions for *Murach’s Mainframe COBOL* or any of its student or instructor’s materials, we would appreciate hearing from you. The easiest way to reach us is to e-mail or call us. We’ll also be glad to answer any questions that you might have.

Thanks for reviewing our book and course materials.

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