NEAR EAST UNIVERSITY

FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES

DEPARTMENT OF COMPUTER INFORMATION SYSTEMS

CIS 468 – Course Notes
(Programming Language IV C#)

Textbook: Doyle, Barbara, C# Programming: From Problem Analysis to Program Design, 4th Ed., Cengage Learning, 2014, ISBN 978-1-285-09626-1.

Overview of the Chapters

Chapter 1 briefly reviews the history of computers and programming languages including the evolution of C# and .NET. This chapter explains the difference between structured and object-oriented programming and includes the software development methodology used throughout the remainder of the book. This chapter describes the different types of applications that can be developed using C#. It discusses the basic elements found in a C# program and illustrates how to compile, run, and debug an application.

The focus in Chapter 2 is data types and expressions. Readers gain an understanding of how types, classes, and objects are related. They also learn how to perform arithmetic procedures on the data, how to display formatted data, and how expressions are evaluated using operator precedence. Chapter 3 extends the manipulation of the data through introducing methods and behaviors of the data. Readers learn to write statements that call methods and to write their own class methods. They learn how to pass arguments to methods that return values and to those that do not.

Readers learn to create their own classes in Chapter 4. This chapter introduces the components of a class including the data, property, and method members. Special methods, including constructors, are written.

Chapters 5 and 6 introduce control structures that alter the sequential flow of execution. Selection control constructs are introduced in Chapter 5. One-way, multiway, switch, and ternary operators used to make decisions are illustrated. Looping is introduced in Chapter 6. The rich set of iteration operators including while, for, do while, and foreach are explored. Recursive solutions are also explored.

Chapter 7 discusses arrays. This chapter describes how to declare and perform compile-time initialization of array elements. The Array class and its many members are introduced.

Methods of the string and ArrayList classes are included in Chapter 8. Multidimensional arrays and other collection classes, including stacks, queues, and hash tables are also introduced in Chapter 8.

Chapters 9 and 10 present a different way of programming, which is based on interactively responding to events. A number of classes in the FCL that are used to create Windows applications are introduced. Elements of good design are discussed in Chapter 9. Delegates are also explored in Chapter 9. Visual Studio's drag-and-drop approach to rapid application development is introduced and used in these chapters. The Windows Presentation Foundation (WPF) is also introduced in Chapter 10 as an alternative approach to Windows Forms for creating Windows applications.

Advanced object-oriented programming features are the focus of Chapter 11. Readers are introduced to component-based development and learn how to create their own class library files. Inheritance, interfaces, abstract classes, sealed classes, generic types, partial classes, and polymorphic programming are discussed in detail. Advanced features such as overriding, overloading, and the use of virtual methods are also included in Chapter 11. Static versus dynamic typing is also investigated in Chapter 11.

Chapter 12 discusses debugging and exception handling techniques. The chapter introduces one of the tools available in Visual Studio, the Debugger, which can be used to observe the run-time environment, take an up-close look at the code, and locate logic errors. The try. . . catch. . .finally block is discussed for handling exceptions. In addition to discussing .NET exception classes, custom exceptions are designed.

Chapter 13 presents the basics of creating, opening, closing, reading, and writing files. The major classes used to work with file and directory systems are introduced.

Chapter 14 introduces a number of new namespaces collectively called ADO.NET, which consists of a managed set of library classes that enables interaction with databases. The chapter illustrates how ADO.NET classes are used to retrieve and update data in databases. The visual programming tools and wizards available with Visual Studio, which simplify accessing data, are covered in this chapter. The Language-Integrated Query (LINQ) is also introduced in Chapter 14.

The focus of Chapter 15 is on Web applications. Readers explore how the design of Webbased applications differs from Windows applications. They discover the differences between static and dynamic Web pages and how HTML and Web server controls differ. Master pages and Cascading Style Sheets are introduced. Also included in Chapter 15 is an introduction to mobile applications that can be viewed with small smart devices such as the Windows Phone. Chapter 15 illustrates how validation controls can be used to check users' input values and shows how the ADO.NET classes, introduced in Chapter 14, can also be used with Web applications to access database records.