

CompuScholar, Inc.
 Alignment to Microsoft Technology Associates (MTA)
"Software Development Fundamentals "
 Certification Exam Requirements

Microsoft Exam Details:

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| Exam Name: | MTA Software Development Fundamentals |
| Exam Code(s): | 98-361 |
| Exam Link: | Exam 98-361: Software Developmetn Fundamentals |

CompuScholar Course Details:

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| Course Title: | Windows Programming with C# |
| Course ISBN: | 978-0-9887070-0-9 |
| Course Year: | 2019 |

Note 1: Citation(s) listed may represent a subset of the instances where objectives are met throughout the course.

Note 2: Citation(s) for a "Lesson" refer to the "Lesson Text" elements and associated "Activities" within the course, unless otherwise noted. The "Instructional Video" components are supplements designed to introduce or re-enforce the main lesson concepts, and the Lesson Text contains full details.

Course Description

The Microsoft Technology Associates (MTA) "Software Development Fundamentals" exam is designed to test a broad range of knowledge spanning general programming concepts, software development lifecycles, website design and web services, desktop applications and Windows services, and databases. Due to the diversity and depth of the topics, more than one year of study and more than one course is generally needed for preparation.

The CompuScholar "Windows Programming with C#" course teaches fundamental programming concepts using the Microsoft C# language. It can be used as preparation for the programming aspects of this MTA exam. Other exam topics are marked as "n/a" below and would need to be covered by supplemental resources, with additional time.

Exam Requirements

| Understanding core programming (15-20%) | CITATION(S) |
|--|---|
| Understand computer storage and data types | |
| How a computer stores programs and the instructions in computer memory | Chapter 1, Lesson 1 |
| memory stacks and heaps | n/a |
| memory size requirements for the various data storage types | Chapter 4, Lesson 1 |
| numeric data and textual data | Chapter 4, Lesson 1 Chapter 4, Lesson 2 Chapter 4, Lesson 4 |
| Understand computer decision structures | |
| Various decision structures used in all computer programming languages | Chapter 5, Lesson 2 Chapter 5, Lesson 3 Chapter 5, Lesson 4 |
| If decision structures | Chapter 5, Lesson 2 |
| multiple decision structures, such as If...Else and switch/Select Case | Chapter 5, Lesson 2 (if/else) |
| reading flowcharts | Chapter 7, Lesson 3 |
| decision tables | n/a |
| evaluating expressions | Chapter 5, Lesson 1 |
| Identify the appropriate method for handling repetition | |
| For loops | Chapter 5, Lesson 3 |
| While loops | Chapter 5, Lesson 4 |
| Do...While loops | Chapter 5, Lesson 4 |
| recursion | Chapter 14, Lesson 2 Chapter 14, Lesson 3 |
| Understand error handling | |
| Structured exception handling | Chapter 10, Lesson 3 |

| Understanding object-oriented programming (20-25%) | CITATION(S) |
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| Understand the fundamentals of classes | |
| Properties, methods, events | Chapter 12, Lesson 3 Chapter 13, Lesson 2 |
| constructors | Chapter 13, Lesson 4 |
| how to create a class | Chapter 13, Lesson 1 |
| how to use classes in code | Chapter 13, Lesson 1 Chapter 13, Lesson 3 |
| Understand inheritance | |
| Inheriting the functionality of a base class into a derived class | Chapter 16, Lesson 1 Chapter 16, Lesson 2 Chapter 16, Lesson 3 |
| Understand polymorphism | |
| Extending the functionality in a class after inheriting from a base class | Chapter 16, Lesson 3 Chapter 16, Lesson 5 |
| overriding methods in the derived class | Chapter 16, Lesson 3 Chapter 16, Lesson 5 |
| Understand encapsulation | |
| Creating classes that hide their implementation details while still allowing access to the required functionality through the interface | Chapter 13, Lesson 3 |
| access modifiers | Chapter 13, Lesson 3 |

| Understanding general software development (15-20%) | CITATION(S) |
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| Understand application life cycle management | |
| Phases of application life cycle management | Supplemental Chapter 2, Lesson 1 |
| software testing | Chapter 10, Lesson 4 Supplemental Chapter 2, Lesson 1 |
| Interpret application specifications | |
| Reading application specifications and translating them into prototypes | Chapter 7, Lesson 3 Supplemental Chapter 2, Lesson 1 / Activity 6 |

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| code | Chapter 7, Lesson 3 Supplemental Chapter 2, Lesson 1 / Activity 6 |
| select appropriate application type, and components | Chapter 7, Lesson 3 Supplemental Chapter 2, Lesson 1 / Activity 6 |
| Understand algorithms and data structures | |
| Arrays | Chapter 11, Lesson 1 |
| stacks | n/a |
| queues | n/a |
| linked lists | Chapter 11, Lesson 2 |
| sorting algorithms | Chapter 14, Lesson 1 |
| performance implications of various data structures | Chapter 11, Lesson 1 Chapter 11, Lesson 2 Chapter 14, Lesson 1 |
| choosing the right data structure | Chapter 11, Lesson 1 Chapter 11, Lesson 2 Chapter 14, Lesson 1 |

| Understanding web applications (15-20%) | CITATION(S) |
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| Understand web page development | |
| HTML, Cascading Style Sheets (CSS), JavaScript | n/a (See CompuScholar: Web Design for in-depth coverage) |
| Understand Microsoft ASP.NET web application development | |
| Page life cycle, event model, state management, client-side versus server-side programming | n/a |
| Understand web hosting | |
| Creating virtual directories and websites | n/a |
| deploying web applications | n/a |
| understanding the role of Internet Information Services | n/a |

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| Understand web services | |
| Web services that will be consumed by client applications, accessing web services from a client application, SOAP and Web Service Definition Language (WSDL) | n/a |

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| Understanding desktop applications (15-20%) | CITATION(S) |
| Understand Windows Store apps | |
| UI design guideline categories, characteristics and capabilities of Store Apps, identify gestures | n/a |
| Understand console-based applications | |
| Characteristics and capabilities of console-based applications | Chapter 2, Lesson 3 Chapter 2, Lesson 4 |
| Understand Windows Services | |
| Characteristics and capabilities of Windows Services | n/a |

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| Understanding databases (15-20%) | CITATION(S) |
| Understand relational database management systems | |
| Characteristics and capabilities of database products, database design, Entity Relationship Diagrams (ERDs), normalization concepts | n/a |
| Understand database query methods | |
| Structured query language (SQL), creating and accessing stored procedures, updating data and selecting data | n/a |
| Understand database connection methods | |
| Connecting to various types of data stores, such as flat file; XML file; in-memory object; resource optimization | n/a |