Boston University Metropolitan College

MET CS 503 D1 Spring 2016 Syllabus

Version 1.0

Instructor

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Office hours: by appointment

Course Location

Building/Rm: SMG/HAR 304
Description: School of Management
Address: 595 Commonwealth Avenue

Course Description

Prerequisite

MET CS342 or MET CS 565 or Equivalent

This course will discuss Microsoft's.NET (4.0) and the C# language in contrast with C++ and Java, the .NET Base Class Library (BCL) and the Common Language Run-time (CLR) services. In-depth exploration of the various .NET services, technologies, pitfalls and best practices for development, debugging, and deployment.

Language: We'll examine many features of the C# language such as the multicast and the asynchronous nature of delegates, inheritance, generics, memory management and finalization. As the course progresses, we'll examine, in context, the various and more advanced features of the C# language.

Environment and Runtime Library and framework: The next topic we'll be covering in detail is the VS.NET development environment, solutions, projects, namespace, dependencies, versioning, common assemblies, and the CLR. We'll dive into a detailed examination of the BCL core classes and components such as diagnostic, logging services, collections, and timers.

File I/O: we'll explore in detail File I/O using Stream and Binary Readers/Writers for sequential access, File Streams for random data access. We'll touch on XML Readers and Writers, XLINQ, then we'll dive into Serialization and the benefits it provides for data storage in binary, or SOAP formats into various storage media such as file system, registry, clipboard, and across the network. We'll examine versioning of Serializable objects for backward compatibility.

Application: Then, we'll start by examining the rules of development of n-tier smart client applications. For the application thin client tier, we'll explore various types of application frameworks such as SDI, MDI, MTI, and service-like applications. In the user interface tier, we'll explore in detail .NET Forms, standard, user and custom controls, components, data binding, data exchange and validation, device I/O handling, visual inheritance, VS.NET extender providers.

Graphics: We'll then examine the presentation layer again in the context of the GDI+ presentation services Graphical Device Interface. We'll examine 2D-vector graphics, imaging, text rendering, including the new features of transparency, gradients, anti-aliasing, double buffering techniques, zooming, off-screen image processing and rendering.

Networking: We'll explore briefly the communications technologies within .NET utilizing the sockets and client communication classes for building unicast-based applications with UDP and TCP in addition to multicasting with UDP. We'll build an instant messenger application to demonstrate the client server versus the peer-to-peer communication model.

Multithreading: We'll discuss in great detail, the .NET threading models, thread management, thread priorities, thread states, thread local storage, thread pooling, updating UI from worker threads, and inter-thread synchronization. We'll examine the various synchronization mechanisms provided by .NET, examine the pitfalls of the various techniques and distill out some best practices of this complex area.

Database: We'll examine data services (ADO.NET: Access Data Objects) utilizing SQL Server and MS Access. We'll take a look at Data Readers, Data Adapters, and Datasets and how XML fits into the picture. We'll examine the benefits of using Data Readers versus Datasets, and the benefits of typed and un-typed Datasets. If time permits, we will cover the new Entity Framework for data access provided by .NET. We'll then explore miscellaneous topics such drag and drop, security, performance counters, file system watchers, and much more.

WPF: Windows Presentation Foundation: is a graphical subsystem for rendering user interfaces in Windows-based applications by Microsoft. It provides similar capabilities to WinForms but is much more complex and feature rich. We'll examine WPF applications and contrast with WinForms.

Time permitting; we may examine some of the following bonus topics:

Web Service and Windows Communication Foundation (WCF): We'll examine also in some detail the Windows Communication Foundation and compare it with some of the predecessor technologies such as DCOM and CORBA. We'll examine Marshal-by-Value and Marshal-by-Reference techniques. We'll examine HTTP and TCP channels in the contexts of binary and SOAP formatters, hosting in IIS or in your own server, scalability, compatibility, interoperability, performance, fault tolerance, and Load balancing

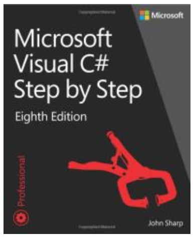
You do not need prior experience in C#, but you should have strong background/experience in a managed object-oriented language such as Java. See Prerequisites.

Courseware

Reference Recommended Books

Microsoft Visual C# 2015 Step by Step

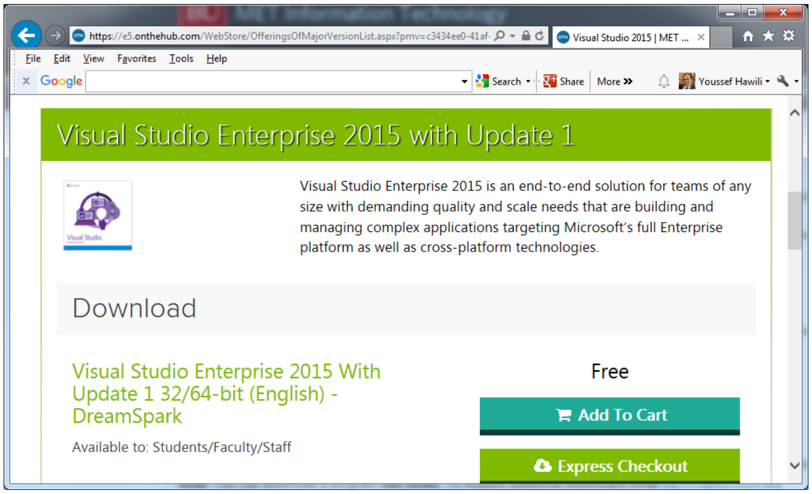
1. Title: **Microsoft Visual C# 2015 Step by Step**
2. Author: **John Sharp**
3. Edition: **Eighth**
4. Publisher: **Microsoft Press; 8 edition**
5. ISBN number: **ISBN-10:** 1509301046, **ISBN-13:** 978-1509301041



Required Software

BU provides the following software free of charge. I will facilitate getting everyone access to the download page.

- Visual Studio 2015 is required. You can get a FREE copy of the software from MSDNAA DreamsPark.
- Use the **Enterprise Edition with Update 1**. See below. http://www.bu.edu/metit/hw-and-sw/msdn-academic-alliance-software-center/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Visual Studio 2015 | MET ...
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Visual Studio Enterprise 2015 with Update 1

Visual Studio Enterprise 2015 is an end-to-end solution for teams of any size with demanding quality and scale needs that are building and managing complex applications targeting Microsoft's full Enterprise platform as well as cross-platform technologies.

Download

Visual Studio Enterprise 2015 With Update 1 32/64-bit (English) - DreamSpark

Free

Available to: Students/Faculty/Staff

- ○ **Any other edition or version is not acceptable.**
- ○ Visual Studio.NET 2008/2010/2012/2013 will NOT be accepted.

Course Material

All course material, including this syllabus is available on BU's blackboard: https://lms.bu.edu/

You need to have a BU account (See Link below) as well as you need to be registered for this course to access the course web site.

On the site, you will find the following material:

1- Course announcements
2- Over 1000 slides for this course
3- A set of C# code samples
4- Icons and Bitmaps
5- All assignments will be available incrementally as assignments are due
6- All source code for the assignments (Solutions) after project submittal after the due date.
7- External documents, links
8- Discussion board

Course Policies

Attendance

To master any challenges that windows programming present, you will need more than knowledge of how to do things but also a clear understanding of underlying implementation in the Windows operating system as well as what and why you have to do things one way versus another. Attending lectures is very crucial to accomplishing this level of understanding. In addition, students are encouraged to participate in the classroom by asking questions and making observations.

Code of Conduct

All coursework must be your own individual effort.

Students are allowed to share ideas, techniques, and thoughts for solving problems. Students are NOT allowed to share any code. Code is private to each person, and any sharing, e-mailing, or posting of any code will be considered a violation of the Boston University academic conduct. Some examples of academic misconduct are cheating on exams; plagiarism (copying someone else's work of any kind and submitting it as your own work); unauthorized collaboration on homework or computer assignments; forgeries; theft of assignments or lab reports; and grade tampering. Conduct that is allowed in one course may be academic misconduct in another course.

I will reserve the right to reject any assignment if I have evidence that collaboration or copying of other people's work was involved, whether the copying was done from students currently attending the course or from any other source. These are the course regulations that I have set forth. By taking this course you are agreeing to the above rules and regulations.

Refer to the BU Metropolitan College Rules of Academic Misconduct:

http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html

Grading Criteria

Each project assignment will be given two weeks. Projects should be handed in using the Online Student Drop box. Any other form of project submittal (including emails) will not be accepted.

Project #1	15%
Project #2	15%
Project #3	15%
Project #4	15%
Final Project	25%
Final Exam	15 %

Projects will be graded based on the following criteria:

1. Functionality/Requirements:
    a. Missing functionality will be penalized accordingly.
    b. Points will be deducted for bugs that are found based on the severity of the bug
2. At least 10 points will be taken off, if your project does not compile. If I cannot make your project compile by trying to fix issues, then I will not grade and you will receive a zero.
3. If your project is missing source code, I will not grade and you get a zero.
4. 10 Points will be deducted for missing executables.

NO LATE PROJECTS WILL BE ACCEPTED: Each Project builds upon the previous one. Hence, students may need to examine the solutions of the previous project to fully maximize their design and implementation of the next project. Project solutions will be uploaded on the due date to the course web site. As a result, late projects cannot possibly be accepted.

NO INCOMPLETE GRADES. Exceptions have to be submitted to me for approval. There needs to be a compelling reason why a course cannot be completed on schedule and it is up to the discretion of the instructor to accept or reject the reason presented.

The grading criteria and ranges that this course undertakes is the following:
Grades are not assigned on a curve but are assigned on the following discrete scale:

100-94 A
93-90 A-
89-86 B+
86-84 B
83-80 B-
79-76 C+
76-74 C
73-70 C-
69-66 D+
66-60 D
59-56 D-
55- 0 F

Getting a BU ACS Account

This course requires an ACS account. This account is the only means by which you can retrieve course information such as syllabus and required material, homework assignments, sample code, and solutions to assignments. Also, you'll have access to an online discussion board where you can ask questions and get answers. Once you've obtained an ACS account you'll get a BU e-mail address. This is the e-mail account that I'll be using for class updates and announcements.

This account can be obtained by following these steps:

1- **Obtain a BU ID#.**
All Boston University students are assigned a nine-character, computer-generated I.D. number. This University I.D. number or 'U' number replaces the old Boston University I.D. number or student's social security number and will be used for all University records including registration, class adjustments, and access to the Terrier Phone.

2- **Obtain an ACS BU account. This requires your BU ID#.**
Go to the following URL:
http://www.bu.edu/tech/accounts/special/acs/create/
Follow the online instructions.
Your account will normally be available within twelve hours.

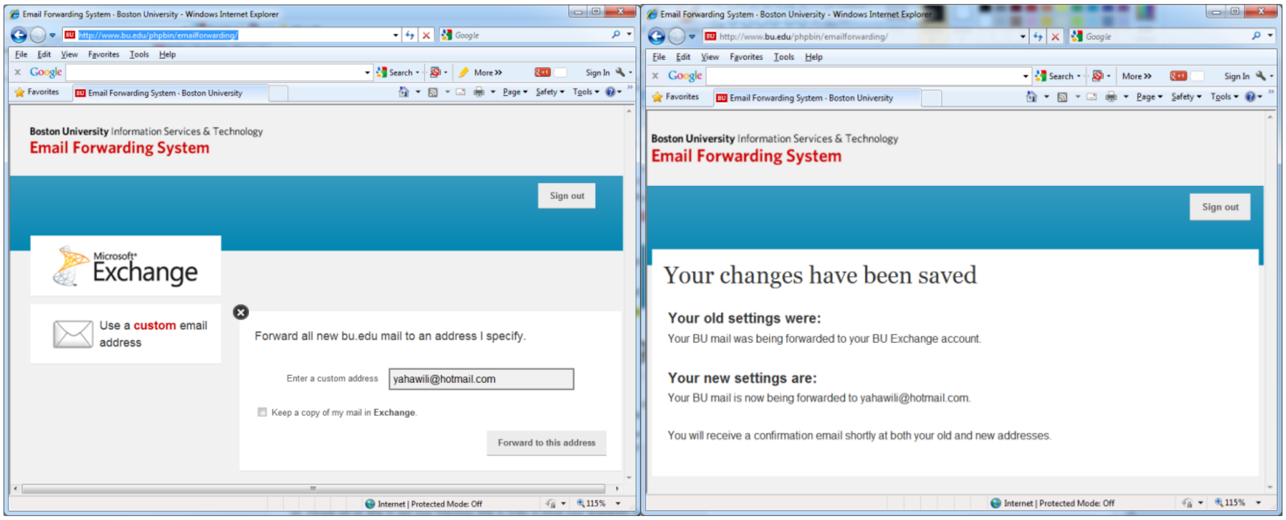
- **If you need help, contact the Office of Information Technology at 617/353-2780 or it@bu.edu**

For setting up mail accounts, using mail programs, ACS web-based mail, etc., refer to the following URLs:

http://www.bu.edu/webmail/

Forwarding your BU e-mail Account

Logon to:
http://www.bu.edu/tech/comm/email/exchange/management/forwarding/


Email Forwarding System - Boston University - Windows Internet Explorer
http://www.bu.edu/phpbin/emailforwarding/
File Edit View Favorites Tools Help
Google
Search
More >>
Sign In
Favorites
Email Forwarding System - Boston University
Page
Safety
Tools
Microsoft Exchange
Internet | Protected Mode: Off
115%

Boston University Information Services & Technology
Email Forwarding System

Sign out

Use a custom email address

Forward all new bu.edu mail to an address I specify.

Enter a custom address: yahawili@hotmail.com

□ Keep a copy of my mail in Exchange.

Forward to this address

Boston University Information Services & Technology
Email Forwarding System

Sign out

Your changes have been saved

Your old settings were:
Your BU mail was being forwarded to your BU Exchange account.

Your new settings are:
Your BU mail is now being forwarded to yahawili@hotmail.com.

You will receive a confirmation email shortly at both your old and new addresses.

Miscellaneous

Important Dates

http://www.bu.edu/reg/dates/official-academic-calendar/official-academic-calendar-2015-2016/

Class cancellations due to Emergencies or Weather

For the Charles River campus, are broadcast on WBUR(90.9) FM, WBZ (1030 AM), WEEI (590 AM), WHDH (850 AM); or by telephone, (617)353-SNOW

Class Meetings, Lectures and Assignments

Week	Topics	Assignments Reading
Jan 21st 2016	• Course Details: Objectives, requirements, Assignments & Logistics • Introduction to C# through the eyes of a C++ or Java programmer. • Building the first windows application, while introducing VS.NET IDE for design, development, and debugging	• Slides: Basic C#, Applications • Assignments: Start working on Project #1

Jan 28th 2016	• N-tier Application Architecture and Design Patterns • Anatomy of a Windows Form-based application, inheritance, properties. • Menus, shortcuts, accelerators, toolbars, Image Lists, Splitters, Panels, User Controls. • Forms, load and close events. • VS IDE, design, coding and debugging Techniques	• Slides: Basic C#, Basic.NET, Applications
Feb 4th 2016	• More VS IDE, design, coding and debugging Techniques TreeViews, ListView, Comboboxes • Application framework, Form Validation and data exchange. • Standard, user and custom controls • Events and delegates.	• Slides: Applications • Project #1 Due
Feb 11th 2016	• More C#, CLR, .NET framework • More User Interface Components and Application Concepts. • Keyboard and mouse handling.	• Start working on Project #2 • Slides: Basic.NET, Applications
Feb 18th 2016	• Memory management and finalization. • File I/O	• Project #2 Due • Slides: FileIO
Feb 25th 2016	• Windows Registry • Windows Clipboard and application data exchange. • Serialization. • Binary and Soap Formatters.	• Start working on Project #3 • Slides: FileIO
Mar 3th 2016	• Graphics Device Interface of .NET known as GDI+. • 2-D Vector Graphics. • Printing and print previewing.	• Project #3 Due • Slides: Graphics
Mar 10th 2016	Spring Break (March 7th -15th)	No Classes
Mar 7th 2016	• Graphics continued: • Typography, Anti-aliasing, Double Buffering and GDI+ Transforms. • Zooming, scrolling	• Start working on Project #4 • Slides: Graphics
Mar 24th 2016	• Drag and Drop • Client application models and frameworks • SDI, MDI, MTI	• Project #4 Due • Start working on Final Project • Slides: Applications
Mar 31st 2016	• Multithreading • .Net Networking • TCP, UDP and HTTP • Sockets	• Slides: Multithreading, Networking
Apr 7th 2016	• TCP, UDP and HTTP • Sockets	• Slides: Networking
Apr 14th 2016	• NET Framework 4.5, C# 4.x • Windows Presentation Foundation. WPF	• Slides: WCF
Apr 21st 2016	• Data Access: ADO.NET. • Designing databases using SQL Server's Enterprise Manager. • Data Readers, Data Adapters, Typed and un-typed Datasets. • *Storing and retrieving textual and binary data to SQL Server.*	• ADO Slides
Apr 28th 2016	• Windows Communication Foundation (WCF) • Misc. Topics	• Last day of classes • Slides: WCP

	• Cloud	• Final Project Due