

Boston University Metropolitan College Course Syllabus

Course Number: MET CS 201

Course Title: Introduction to Computer Science with C++

Spring 2015

January 20, 2015 – May 9, 2015

Instructor Name: Shereif El-Sheikh

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Office Hours Online or by Appt:

Questions should be submitted online through the discussion board or via email. Responses can be expected within 24-36 hours.

Required Text(s)/Software/Tools:

Required Text:

Starting out with C++ from Control Structures through Objects (Brief Version), 7th Edition, Tony Gaddis, Addison-Wesley, ISBN: 978-0132772891

Free Compilers:

PC: Microsoft Visual C++ Express Edition (2010 edition preferred)

MAC: Xcode or Eclipse or NetBeans

Course Prerequisites

None.

Course Description

Introduces C++ programming, including the language, its history, applications, and implementation. Presents rudimentary concepts of the language along with a detailed explanation of how different programming constructs are used. Uses weekly programming assignments to provide students with experience in the use of primitive data types and program controls and to introduce C++ classes and objects.

Course Outcomes

Students will have the opportunity to learn object oriented programming using the C++ programming language. Learning objectives include:

- Write syntactically correct C++ code to perform basic programming tasks.
- Demonstrate understanding of Boolean Logic, If-Then-Else Clauses, Looping, Nested Looping, Control Structures and Objects.
- Generate algorithms, prototyping these algorithms in pseudocode, and finally expressing algorithms in syntactically correct C++ Code.
- Design a program given a problem statement and demonstrate the solution within the C++ programming environment.

Course Methodology

Each week, you will be expected to:

1. Review the week's learning objectives.
2. Complete all assigned readings.
3. Complete all lecture materials for the week.
4. Complete and submit all assignments and tests by the due dates.
5. Attend class.

Participation

Course participation and collaboration with the instructor and peers is a requirement of the course.

Grading/Evaluation Standards

There will be a weekly homework assignment. Assignments must be submitted in class via hardcopy. Late assignments are not accepted. The lowest homework will be dropped.*

This is a scaffolded course, material learned in prior weeks directly ties into subsequent weeks. With this in mind, there will be a short quiz, roughly once a week. The purpose of the short quiz is to identify and help students struggling with course material. There are no make up quizzes. The lowest quiz will be dropped.*

Collaboration in this course is sought and encouraged. Throughout the term small amounts of **extra credit will be offered to students who form and engage in study groups.** The instructor will endeavor to attend study groups and offer assistance when possible.

The purpose of homework is to ensure that students understand material presented in class. It is hoped that you will work with your peers on course assignments (and to prepare for exams). There is no penalty for working together and no penalty for presenting identical solutions on homework. The goal is to ensure that everyone understands the material. If you choose to collaborate on course assignments, **you are required to clearly disclose on the first page of your submission the individual(s) with whom you collaborated.**

***It is understood that students may need to miss a class due to unforeseen circumstances. To be fair to all students, the grading policy is to drop the lowest homework and the lowest quiz grade.**

Participation	5%
Assignments:	20%
Quizzes:	25%
Exam:	20%
Final Exam	<u>30%</u>
	Total: 100%

Class Schedule / Topical Outline

Week	Dates	Topic	Assignments
1	1/20/2015	<i>Lecture 1: Introducing C++</i> <ul style="list-style-type: none"> • Brief Background on C++. • What can be done in C++. • Demonstration of C++ in the Integrated Development Environment (IDE). • Program Style/Layout • Introduction to data types. 	Chapters 1 and 2
2	1/27/2015	<i>Lecture 2: Variables, Types and Expressions.</i> <ul style="list-style-type: none"> • <i>Data Types, Booleans, Integers, Real Numbers, Characters and Strings</i> 	Chapters 1 and 2

		<ul style="list-style-type: none"> • <i>NULL values/voids</i> • <i>Variables and Constants</i> • <i>Variable Scope.</i> 	
3	2/03/2015	Lecture 3: Variables, Casting, Expressions <ul style="list-style-type: none"> • Type Conversion – Casting • Assignments and Expressions • Shorthand Arithmetic Assignment Statements • Boolean Expressions and Operators • Debugging with the IDE. 	Chapters 3 and 4
4	2/10/2015	Lecture 4: <i>Branching</i> <ul style="list-style-type: none"> • <i>Relational and Logic Operators, eg, less/greater than, AND/OR/NOT operations.</i> • <i>Conditional Statements If-Then-Else and Switch.</i> 	Chapters 3 and 4
NO CLASS 	2/17/2015	<i>PRESIDENTS DAY (Substitute Monday's classes for Tuesday)</i>	Review Chapters 2-4 (optional)
5	2/24/2015	Lecture 5: <i>Branching</i> <ul style="list-style-type: none"> • <i>Relational and Logic Operators, eg, less/greater than, AND/OR/NOT operations.</i> • <i>Conditional Statements If-Then-Else and Switch.</i> 	Chapters 3 and 4
6	3/3/2015	Lecture 6: <i>Looping</i> <ul style="list-style-type: none"> • <i>Introduction to looping – For, While and Do-While</i> • <i>Blocks and Scoping</i> • <i>Introduction to Nested Looping</i> Introduction to looping – For, While and Do- While <ul style="list-style-type: none"> • Blocks and Scoping • Introduction to Nested Looping 	Chapters 4 and 5
BREAK 	3/10/2015	SPRING BREAK	
7	3/17/2015	Lecture 7: <i>Synthesis + Intro to Functions and Return Values</i> <ul style="list-style-type: none"> • <i>Variables, Branching, Looping (Synthesis)</i> • <i>Modular Programming</i> • <i>User-defined Functions</i> • <i>Local and Global Variables</i> 	Chapters 5 and 6
8	3/24/2015	EXAM + Short Lecture Review of Functions and Return Values	
9	3/31/2015	Lecture 8: <i>More on Functions and Return Values</i> <ul style="list-style-type: none"> • <i>Value and Reference Parameters</i> • <i>More on Nested Loops</i> • <i>Returning values</i> 	Chapters 6 and 7
10	4/7/2015	Lecture 9: <i>Files and Streams</i> <ul style="list-style-type: none"> • <i>Review Functions and Return Values</i> • <i>File Operations - Why Use Files?</i> • <i>Streams – Input and Output Using ">>" and "<<"</i> • <i>Error Testing – Checking for Failure with File</i> • <i>Character Input and Output - Formatting</i> 	Chapters 6, 7 and 12 (sections 1 through 6)

		• Seeking and Randomly Accessing Files	
11	4/14/2015	<i>Lecture 10: Structured Data, Introduction to Abstract Data Types</i>	Chapter 10, 11
12	4/21/2015	<i>Lecture 11: Structured Data/Introduction to Classes Pulling it all together</i>	Chapter 11, 13
13	4/28/2015	<i>Lecture 12: More on Classes, Synthesis, Demo of Rapid Application Development Wrap up plus prep for Final Exam</i>	Review Chapters 10, 11, 13
14	TBD	<i>FINAL EXAM</i>	

Online Component

Students will be responsible for keeping track of course announcements, downloading assignments, participating online, and gathering course handouts from the Blackboard website (<http://blackboard.bu.edu/webapps/portal>). A valid BU Login ID and Kerberos password will be necessary to access this site. Homework Assignments will be posted on the evening of class.

Academic Integrity Policy

The University views academic dishonesty as one of the most serious offenses that a student can commit and imposes appropriate punitive sanctions on violators. The course is governed by the Academic Conduct Committee policies regarding plagiarism.

With this in mind:

- Collaboration is allowed on homework assignments.

- Collaboration is not allowed on quizzes or exams.

- Your posts on the discussion must be your own thoughts or build upon the thoughts of others who have previously posted. You may also construct your posts based upon other resources, (e.g., - online from other websites or blogs). If you choose to utilize work from other sources, you must reference these in your post.

**For additional information please visit <http://csmet.bu.edu>
Computer Science Department at Boston University Metropolitan College**
