Boston University
Metropolitan College

Data Structures with C++

CS 341 A1, Spring 2020
Course Format: On Campus Face-to-Face
Rev 0

Instructor: John S. Maslanka, Ph.D.
email: maslanka@bu.edu
Department phone: 617-353-2566
Classroom: CAS 204A
Office hours: before or after class or by appointment
Home phone: 781-784-6232

Course Description

The student is expected to gain an Object-Oriented understanding of Data Structures using the C++ Programming Language. Topics include data abstraction, encapsulation, information hiding, and the use of recursion, also creation and manipulation of various data structures: searching and sorting algorithms, lists, stacks, queues, trees, hashing, and graphs. Programming methods for accessing these structures are at the heart of understanding the subject matter of this course. Students are encouraged to bring their laptops to class and to assist in the development and enhancement of course materials.

Preliminary Expectations:

All students have successfully completed MET CS 231 or the equivalent in an academic environment prior to entering this course. Also, all students are expected to be acquainted with the usage of a full-capability Interactive Development Environment (IDE) such as MS Visual Studio, Oracle NetBeans, IBM Eclipse, XCode on MacOSX, or the unix or linux development environments.
Homework assignments are to be completed on a system such as Windows-2000, -NT or –XP or Windows-7 or -10, or a UNIX or linux-based system or Apple OS system, which supports the ANSI-98 Standard version of C++ or higher. The current version is C++11, ratified and published in 2015.
All students are expected to participate in class discussions.

TextBooks:

- **Professor's Class Notes and Programs on Blackboard.** (See Courseware below.)
- **DATA STRUCTURES & Other Objects Using C++, 4th edition,** by Michael Main and Walter Savitch, Pearson Addison-Wesley, 2011, ISBN13: 978-0-13-212948-0. **(MS)**

References:

- **Introduction to Programming in C++**, edition 1, by John Maslanka, publisher Kendall-Hunt, 2009, ISBN 978-0-75475-6465-7. **(JM)** Excerpts will be made available on Blackboard.
- **C++ How To Program**, 10th edition, by Harvey & Paul Deitel, Pearson, ISBN 978-0-13-337871-9, 2014.
-

Courseware:

Online **Blackboard** will be used in conjunction with this course. The CS341 Spring 2020 website will be self-enrolling and you are expected to view its contents frequently.

Course Policies

1) Attendance & Absences – All students are expected to attend every class. Please inform me by email as soon as possible if you need to be absent from a class. The student is expected to make up all work from the missed class or classes including class notes, exams and homework assignments.

2) Assignment Completion & Late Work – All homework assignments are due on the dates specified in the attached course calendar. The Midterm exam will be a takehome exam and will be distributed in class and made available on Blackboard on the date specified in the course calendar. It will be due on the due date specified in the calendar. The Final Exam will be given in class on the date during the Final Exam period of the semester which is specified in the attached course calendar. All other course work and assignments must be completed and submitted prior to the Final Exam.

3) **Code of Academic Conduct** – Academic Integrity is required of all students. Cheating and plagiarism will not be tolerated in any Metropolitan College course. Such actions will result in no credit for the assignment or examination and may lead to disciplinary actions. Please take time to review the Student Academic Conduct Code which can be found at the following URL: http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html. The Academic Code of Conduct should not be understood as a discouragement for discussing the course material or your particular approach to a problem solution with other students in the class or from forming and participating in study groups. On the contrary – you may share your thoughts, questions and solutions with your classmates. Nevertheless, if you choose to work in a group, you as the individual student will be expected to produce your own original solutions to homework and exam problems. Also, you are required to document by a citation the usage of any work by another person including myself and any materials which you may find online or in textbooks or publications.

Grading Criteria:

Midterm Exam: 25%, Final Exam 25%, Assigned Homework Problems: 50%. There will be **five** homework/lab assignments, for which the due dates are specified in the course calendar. Additional assignments will be made available on a per-request basis. The problem statements for these assignments will be approved by the Professor. The students will email their completed **source.cpp** and **source.h** files for the homework problem solutions, as well as Midterm and Final Exam, to the professor at **maslanka@bu.edu**. All homework assignments and the Midterm should be emailed to the professor prior to 6:00PM on the due dates listed in the course calendar.

Dr. Maslanka is a professional writer of computer language compilers and run-time systems. He is retired from Hewlett Packard Company/Compaq Computer Corporation/Digital Equipment Corporation, having worked in their Marlboro, MA, and Nashua, NH, facilities from 1975 to 1984 and from 1991 until his retirement from HP in 2002. Also, he has been Adjunct Faculty in the BU MET College Computer Science Department since 1973.

Course Calendar Spring 2020: Class Meeting Dates, Lecture Topics and Due Dates

Date	Topic	Readings	Assignments due
Jan 22	Course Introduction and Overview of Course Topics; Keyboard and text file IO.	JM Ch 4 Blackboard	None
Jan 29	Review Function syntax, Conditionals, Array processing; Recursion; Homework Statement 1 available.	JM Ch 5,6,9 Blackboard	None
Feb 5	Sorting Algorithms—Bubble, Selection; Merge Sort; Program Efficiency & Big-O	MS Ch 9, 12, 13	Homework 1 due in email by 6:00PM
Feb 12	Programming using C++ class Homework Statement 2 available	JM Ch 12	None
Feb 19	Aggregation and Abstract Data Types Singly Linked Lists, Stacks	JM Ch 15, 18 MS Ch 3	Homework 2 due in email by 6:00PM
Feb 26	Container class with a Singly Linked List Homework Statement 3 available	MS Ch 35 Blackboard	None
Mar 4	Discussion of Upcoming Midterm Exam; C++ Template functions and classes, Standard Template Library, Iterators;	JM Ch 9, 19, 20	Homework 3 due in email by 6:00PM,
Mar 11	Spring Break; Midterm to be available on Blackboard	Blackboard	None
Mar 18	Doubly linked Lists, Queues; Hashing	MS Ch 6, 7, 8 Blackboard	None
Mar 25	Introduction to Trees; Building Binary Trees, Traversals and Searches	MS Ch 11 Blackboard	Midterm Exam due in email by 6:00PM
Apr 1	Binary Trees -- AVL Reorganizations Homework 4 available	Blackboard	None
Apr 8	Binary Trees -- Full Reorganizations; Removals of Nodes;	Blackboard	None
Apr 15	Introduction to Graphs / Networks – Creation of Graphs, Traversals Homework 5 available	MS Ch 15 Blackboard	Homework 4 due in email by 6:00PM
Apr 22	No class, sub for Patriots Day – Apr 20	None	None
Apr 29	More Graphs – exam of algorithms; Overview for Final	Blackboard	Homework 5 due in email by 6:00PM
May 6	Final Exam in-class 6:00 – 8:00PM	All	Final due date for all outstanding work*

***Note: All outstanding assignments are due to the Professor in email by 6:00PM on the evening of the Final Exam. Any gradables which are received after that time will not be graded. My final course grades are due to the Registrar by 5:00PM, May 9.**