CISC 3115 -- Modern Programming Techniques Spring 2021

Instructor: Ari Mermelstein

Course Code: ERQ6

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Class meeting hours: Thursdays 6:30-10:00PM on blackboard collaborate

Office hour and room: Thursdays 5:00-6:00 on blackboard collaborate or by appointment

Required Textbook

Starting Out with Java, from Control Structures Through Data Structures, Third Edition by Tony Gaddis
ISBN: 9780134038179

Prerequisite

CISC 1115 - Introduction to Programming Using Java.
A grade of C or higher in CISC 1115 is required to be able to take CISC 3110.

Information most needed from CISC 1115:

1. Conditional statements (including if-statements, switch statements, and the ternary operator)
2. Loops (including for-loops and while-loops)
3. Arrays (including how to declare arrays, how to iterate through arrays, and how to pass arrays to methods)

4. Methods (including void returning methods, methods that return a value)

5. Parameter passing schemes (difference between pass-by-reference and pass-by-value)

6. How to work with files (both input and output)

7. How to use Strings and the associated string library methods (e.g. indexOf(), length(), +, +=, ==, equals(), compareTo(), substring(), etc.)

Course Objectives

After successfully completing this course, students will be able to

1. Trace and write programs using object-oriented programming techniques.
2. Use effectively the programming environment offered by a Unix-like system.
3. Implement recursive solutions to problems and demonstrate how recursion is implemented by tracing changes in the runtime stack.
4. Understand Inheritances and Polymorphism in object-oriented systems,
5. Understand the difference between procedurally oriented programming and object-oriented programming and be able to program rigorously in both styles.

6. Use inheritance, polymorphism, and interfaces to program using Java's graphics software

7. Program simple webpages using HTML and CSS.

Academic Integrity

The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for policy implementation can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member *must* report the violation.

Non-Attendance Because Of Religious Observance

The state law regarding non-attendance because of religious beliefs is on p. 53 in the Bulletin. Please let me know now if you have to miss an exam (as far in advance as possible).

Center for Student Disability Services

In order to receive disability-related academic accommodations students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services, Ms. Valerie Stewart-Lovell at (718) 951-5538. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation with him/her.

Important Dates For the Spring 2021 Semester

Friday, January 29 - First day of weekday class

Thursday, February 4 - Last day to add a class.

Friday, February 12 and Monday, February 15 -- College Closed

Saturday, March 27 – Sunday April 4 – Spring Recess

Monday, May 17 – Last day to withdraw with a W.

Tuesday, May 18 – Reading Day

Grades

First Test - 25%
Second Test - 25 %
Final Exam- 30%
Homework - 15%
Participation- 5%
Note: Participation really does mean participation. This is not a free 5 points. It must be earned.

Exam Dates - Tentative

The first exam will be held on Thursday March 11.
The second exam will be held on Thursday April 29.

The exams will be held on blackboard.

The final exam (not tentative) will be on Thursday, May 20, 2021 at **6:00 PM (NOT 6:30!)**

Note: The final exam will be cumulative, and I am not allowed to give any more time than 2 hours.

Exams will be given via blackboard during regular class time on the days listed above. You will not be permitted to backtrack and answer questions that you've already seen. Last term, many students googled answers, and I could tell. If this happens, I will give a 0 for that question.

Final grade calculation

Your letter grade will be determined as follows:

A+ : 98-100
A : 93-97
A- : 90-92

B+: 87-89

B: 83-86

B-: 80-82

C+: 77-79

C : 73-76

C- : 70 - 72

D+: 67-69

D: 63 - 66

D- : 60 - 62

F : < 60

I do not curve final grades by many points. I may round grades up or give a few points based on merit, but I will not curve grades by tens of points.

Class

We will meet on blackboard collaborate on Thursday nights at 6:30PM. You can find this on blackboard under the course tools tab. You must have a working microphone and must join the session.

Homework

Homework will be assigned every 1-2 weeks, and you will typically have 2 weeks to complete assignments. Assignments will typically include multiple files. **Only code that is commented and documented, explaining what the code does will be marked fully correct. If I can't ascertain the correctness of your solution, I cannot possibly grade it properly.**

Homework must be emailed to mermelstein.homework@gmail.com with your name and CISC 3115 in the subject. Instead, we may use blackboard. We will test this out.

The homework assignments will be graded out of 10.
Late homework will not be accepted under any circumstances, unless you have spoken to me ahead of time, explaining why you need an extension. I am more than happy to grant extensions if you are honest with me.

In addition, there will be Codelab assignments periodically assigned. Your grade on all the Codelab assignments combined will be averaged in as one homework. Information on how to register for Codelab is on

the course website. If you took CISC 1115 in Brooklyn College, you need to just add a course, and registering a new account will not be necessary.

UNIX Accounts

Normally, the UNIX operating system and basic commands for it are covered in CISC 3115. Normally, I just tell you to get your account from the WEB where we were supposed to be. Alas, we're only meeting online. It may be possible for you to still get these accounts and I am in contact with the college to do so. If so, I will let you know how to safely claim these accounts; if not, I will show everyone how to set up a virtual machine with which to work. If you have a Mac, you can just use the terminal program on your computer instead. While it may be easier to just skip it, knowing basic UNIX will help you, especially if you want to learn web design, databases, and other stuff. (It'll also motivate what that mysterious String[] args business is all about!)

Topics List

1.Review of CISC 1115

2. How to use UNIX and UNIX-like operating systems

- •How to create and delete directories (folders)
- • How to navigate in the file system
- • How to use *nano* or *vim* as an editor to write programs
- • How to compile Java programs in UNIX
- • How to display files.
- • How to list the files in a directory

- How to redirect input and output.
- How to use *ssh* and *sftp* to login to UNIX accounts remotely and to transfer files between computers.
- Command line arguments

3. Recursion
    - The difference between iteration and recursion.
    - The difference between iterative processes and recursive processes
    - How to think recursively
    - How to solve problems recursively
    - How the computer's stack is used during recursive calls.
4. Classes
    - What classes are
    - How to write a simple class
    - What access specifiers are
    - What encapsulation is
    - static vs. non-static member variables
    - static vs. non-static methods
    - methods inside of classes
    - accessors and mutators
    - constructors
    - The Object class
    - method overriding and equals() and toString()

- How to declare references to objects.
- How to initialize objects of classes.
- How to declare and initialize arrays of objects.

5. Interfaces
    - How to create an interface
    - How to write a class that implements an interface.
6. Inheritances and Polymorphism
    - What inheritance is
    - How to write classes that inherit from other classes
        - How to write a superclass as the base for other classes.
    - How to leverage this behavior in large scale systems.
    - What polymorphism is
    - How to use polymorphism in code.
7. Introduction to data structures
    - How to use Java's ArrayList
    - How to implement our own simple ArrayList class
    - How to use Java's Map classes and how to solve problems using them
8. Graphics
    - How to use inheritance, polymorphism, and classes to create our own graphical systems.

- How to create buttons, sliders, etc.
- How to use graphical layouts
- How to draw shapes, and other pretty images using code.

9. Webpages
    - Basic HTML
    - Basic CSS (optional)
    - Applets
        - How to paint graphical images on applets
        - How to embed applets in webpages