

BMI 540: Computer Science with Java Programming

Oregon Health & Science University

Fall 2014

General Information

Dates:

September 29, 2014 – December 12, 2014

Instructor:

Justin Fletcher, PhD
Email: fletchju@ohsu.edu
Office: BICC 415

Required text:

Java: An Introduction to Problem Solving & Programming. Sixth Edition, Walter Savitch, Pearson/Prentice-Hall, 2011.

**Note: While it's preferable that you use the 6th edition, the 5th edition is acceptable for use. The figure numbers and page numbers will not match those in the lectures, however.*

Additional optional material:

Computer Science: An Overview. Eleventh Edition, J. Glenn Brookshear, Addison-Wesley, 2011.
Technology in Action, Complete Version. Tenth Edition, Alan Evans, Kendall Martin, Mary Anne Poatsy, Prentice-Hall, 2014.
Head First Java (2nd Edition), Kathy Sierra and Bert Bates. O'Reilly Press, 2005.

Class times and location:

On campus: Wednesdays and Fridays, 9:00 – 10:20 am, BICC 124
Distance: Course material posted on Wednesdays.

Overview

BMI 540 provides an introduction to computer science and programming demonstrated through the Java programming language. In addition, the course includes the presentation of computer science principles, including computer representation and storage of data, structured programming, object-oriented programming, and algorithms. The goal of this class is to expose Medical Informatics students to software development with an object oriented programming language so they can communicate effectively with software developers and/or continue further with learning software programming and development.

Prerequisites

Students should have knowledge of basic structured programming techniques prior to admission to the class; students should have completed at least one prior college level course in computer programming, such as C, Perl, Visual Basic, C++, or beginning Java. In addition, students must pass a pretest before enrolling in the course OR have completed the Intro to Programming online course at OHSU.

Goals of the Course

The main goal of BMI 540 is to introduce students to the fundamentals of computer science and object-oriented programming in Java. Specific topics for BMI 540 include:

- The history of computing
- Computer representation and manipulation of data
- Operating system basics
- Algorithms, iterative and recursive structures, efficiency and correctness
- Fundamental data structures
- Fundamental data types, such as strings, integers, floats, etc.
- Control structures, such as if-then, while, etc.
- Classes and methods
- Program modularity, step-wise refinement and divide-and-conquer approaches to problem solving
- Simple I/O from files.
- Introduction to other areas of computer science that are important to medical informatics

Computing Environment

Students will be using the eclipse IDE on their personal Macs and/or PCs; more details will be provided during the course.

Instructions for turning in your work will be provided with each exercise and must be followed exactly for full credit.

Grading

The class will require completion of weekly homework assignments and two examinations. The final grade will be determined with an approximate weighting of

Homework 40%

Quizzes 30%

Final Exam 30%

Homework assignments must be turned in by the due date. Only assignments that are correct and complete upon submission by the original due date will receive full credit.

Learning to program can be very time consuming and frustrating, but the only way to learn is by doing. It is in your best interests to keep up with the homework assignments and the reading, as it is easy to get hopelessly behind. To encourage everyone to keep up, assignments that are not submitted on time will be penalized. Late assignments will be downgraded up to 10% per day.

Assignments that are more than ten days late will not be accepted.

Final grades are determined at the end of the quarter and usually are assigned as follows:

A	94 – 100
A-	90 – 93
B+	87 – 89
B	83 – 86
B-	80 – 82
C+	77 – 79
C	73 – 76
C-	70 – 72
D/F	< 70

Graduate Studies in the OHSU School of Medicine is committed to providing grades to students in a timely manner. Course instructors will provide students with information in writing at the beginning of each course that describes the grading policies and procedures including but not limited to evaluation criteria, expected time needed to grade individual student examinations and type of feedback they will provide.

Class grades are due to the Registrar by the Friday following the week of finals. However, on those occasions when a grade has not been submitted by the deadline, the following procedure shall be followed:

- 1) The Department¹/Program Coordinator² will immediately contact the Instructor requesting the missing grade, with a copy to the Program Director and Registrar.
- 2) If the grade is still overdue by the end of next week, the Department¹/Program Coordinator² will email the Department Chair directly, with a copy to the Instructor and Program Director requesting resolution of the missing grade.
- 3) If, after an additional week the grade is still outstanding, the student or Department¹/Program Coordinator² may petition the Office of Graduate students for final resolution.

1 For courses that are run by a specific department.

2 For the conjoined courses (course number is preceded by CON_ that are run by Graduate Studies.

Academic Honesty

Academic honesty is required in order to pass this course. Students are encouraged to help each other; nevertheless, all quizzes, written assignments and presentations must be the work of the

individual student. Literature and resources (including Internet resources) employed in fulfilling assignments must be cited.

Likewise, students are expected not to collaborate on the answers to homework problems that do not require programming, although discussion of the concepts involved and working of similar problems together is permitted.

See http://www.ohsu.edu/xd/education/library/research-assistance/plagiarism.cfm?WT_rank=1# for information on code of conduct for OHSU and <http://www.ohsu.edu/xd/education/teaching-and-learning-center/for-students/index.cfm> for more information on citing sources and recognizing plagiarism.

In an effort to uphold the principles and practice of academic honesty, faculty members at OHSU may use originality checking systems such as Turnitin to compare a student's submitted work against multiple sources.

To protect student privacy in this process, it will be necessary to remove all personal information, i.e. student name, email address, student u-number, or any other personal information, from documents BEFORE submission.

Copyright Information

Every reasonable effort has been made to protect the copyright requirements of materials used in this course. Class participants are warned not to copy, audio, or videotape in violation of copyright laws. Journal articles will be kept on reserve at the library or online for student access. Copyright law does allow for making one personal copy of each article from the original article. This limit also applies to electronic sources.

To comply with the fair use doctrine of the US copyright law, Sakai course sites close three weeks after grades are posted with the Registrar. Please be sure to download all course material you wish to keep before this time as you will have no further access to your courses.

Use of Sakai

This course will have an online component, which can be accessed through Sakai, OHSU's online course management system. For any technical questions or if you need help logging in, please contact the Sakai Help Desk.

Hours: Sakai Help Desk is available Mon – Fri, 8 am – 10 pm and weekends and holidays 12 pm – 5 pm

Contact Information:

(Toll-free) 877-972-5249

(Web) <http://atech.ohsu.edu/help>

(Email) sakai@ohsu.edu

Student Access

OHSU is committed to providing equal access to qualified students with disabilities. Student Access determines and facilitates reasonable accommodations, including academic adjustments and auxiliary aids, for students with documented disabilities. A qualified student with a disability is a person who meets the academic and technical standards requisite to admission or participation in a particular program of study. As defined by the Americans with Disability Act (ADA), a person with a disability has a physical or mental impairment that substantially limits one or more major life activities of the individual. This may include, but is not limited to, physical conditions, chronic health issues, sensory impairments, mental health conditions, learning disabilities and ADHD. Student Access works with students with disabilities from all of OHSU's educational programs and at each campus.

Each school has an assigned Program Accommodation Liaison (PAL), who acts as an "in-house" resource for students and faculty concerning access issues for students with disabilities. The PAL works in collaboration with Student Access to implement recommended accommodations for students with disabilities.

It is recommended that you contact Student Access to consult about possible accommodations if you a) received disability accommodations in the past, b) begin experiencing academic difficulties, and/or c) are given a new diagnosis from your healthcare provider.

Learn more about Student Access:

Phone: 503-494-0082

(Web) www.ohsu.edu/student-access

(Email) studentaccess@ohsu.edu

DMICE Communication Policy

1. If the syllabus directs the student to contact the TA before contacting the instructor, the student should do so. Otherwise, the student should contact the instructor and allow 2 business days (not including weekends) for a response.
2. If the student does not receive a response from the instructor within 2 business days, s/he should contact the TA (if there is one). When contacting the TA s/he should cc the instructor and Diane Doctor at doctord@ohsu.edu.

3. If a student does not receive a response from the TA within 1 business day (not including weekends), s/he should contact Diane Doctor at doctord@ohsu.edu and cc the instructor and the TA.
4. If Diane does not reply within 1 business day (not including weekends), the student should contact Andrea Ilg at ilgan@ohsu.edu.
5. Students having difficulties with Sakai should contact the Sakai Help Desk at sakai@ohsu.edu or at (877) 972-5249. Sakai help is available M-F from 8am to 10-pm and weekends from Noon to 5pm. Do not contact the instructor.

Schedule of Topics (tentative)

Week	Topic	Readings	Homework
1	<ul style="list-style-type: none"> ➤ Intro to Computers and Java ➤ The History of Computing 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 1 ➤ Recommended: Brookshear, Ch. 0; Evans, Ch. 1-2 	Install Eclipse and write a simple program
2	<ul style="list-style-type: none"> ➤ Introduction to Object Oriented programming with Java ➤ Java Primitive Types, Strings and Console I/O 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 2, 5 ➤ Recommended: Brookshear, Ch. 6.5 	Simple program with two classes
3	<ul style="list-style-type: none"> ➤ Flow of Control in Java ➤ Data Representation and Manipulation 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 3, 4 ➤ Recommended: Brookshear, Ch. 1, 2 	Program using Java control structures, constants, variables; data representation exercises
4	<ul style="list-style-type: none"> ➤ Arrays, Debugging in Java ➤ Quiz #1 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 7.1 	
5	<ul style="list-style-type: none"> ➤ OOP: Classes, Objects, Methods, Scope, Constructors, Overloading ➤ Operating Systems 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 5, 6 ➤ Recommended: Brookshear, Ch. 3; Evans, Ch. 5 	Write a multiple class program with arrays; OS concepts
6	<ul style="list-style-type: none"> ➤ Inheritance ➤ Algorithm Efficiency 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 8 ➤ Recommended: Brookshear, Ch. 5 	Write a multiple class program with inheritance; algorithm efficiency concepts

7	<ul style="list-style-type: none"> ➤ Abstract Classes, Dynamic Binding & Polymorphism ➤ Building a Program in Java ➤ Quiz #2 		
8	<ul style="list-style-type: none"> ➤ Exception Handling, File I/O ➤ Data Structures 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 9, 10 ➤ Recommended: Brookshear, Ch. 8 	Program with I/O from files; data structure concepts
9	<ul style="list-style-type: none"> ➤ Java Data Structures ➤ Thanksgiving holiday 	<ul style="list-style-type: none"> ➤ Required: Savitch, Ch. 12 	Program using linked list or tree structure
10	<ul style="list-style-type: none"> ➤ GUIs & Java Swing ➤ Optional: Databases and Networking 	<ul style="list-style-type: none"> ➤ Recommended: Savitch, Ch. 15 ➤ Recommended: Brookshear, Ch. 4 & 9; Evans, Ch. 11-12 	
11	<ul style="list-style-type: none"> ➤ Final Examination 		