CS 1B: INTERMEDIATE SOFTWARE DESIGN IN JAVA
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Course Information

Course Number/Term:	CS 1B – Spring 2019 (4/8-6/28/19)
Instructor:	**Hanan Ibrahim**
Email:	ibrahimhanan@fhda.edu
Course Dates and Times:	TBA
Office Hours:	Mondays 11:00 AM –12:00 PM (Online)
	On Campus: By appointment - Room 4124
Course Website:	https://foothillcollege.instructure.com
Online Java Resources:	Java Documentation

Description

Systematic treatment of intermediate concepts in Computer Science through the study of Java object-oriented programming (OOP). Coding topics include Java interfaces, class extension, generics, the Java collections framework, multi-dimensional arrays and file I/O. Concept topics include OOP project design, inheritance, polymorphism, method chaining, functional programming, linked-lists, FIFOs, LIFOs, event-driven programming and guarded code.

Advisory

Prerequisite: C S 1A or 1AH.

Student Learning Outcomes (SLOs)

1. Use the Java environment to define the basic abstract data types (stacks, queues, lists) and iterators of those types to effectively manipulate the data in a program.

2. Define and use Java generics to make data and algorithms work with a variety of data types.

3. Write and debug Java programs which make use of inheritance, i.e. the "is a" relationship, common to all OOP languages. Also define base and derived classes and use common techniques, such as method chaining, in a program.

Course Objectives

- Describe the basic components of the Java software development environment.
- Configure a Java Development Kit (JDK) and Integrated Development Environment (IDE) for advanced Java programming.
- Use both instance members and static members, as appropriate, in class design.
- Analyze and demonstrate the use of multi-dimensional arrays in Java.
- Design, implement, and test Java programs that use class inheritance.
- Demonstrate the use of function chaining between derived class and base class methods.
- Describe the difference between deep copies and shallow copies in Java and write programs that effectively handle deep memory.
- Explain how guarded code is implemented in Java through exceptions.

- Express numbers in decimal, binary, and hexadecimal representations and use bitwise logical operators to process data at the bit and byte level.
- Identify an inner class and note its use in event-driven Graphical User Interface (GUI) code.
- Demonstrate a working knowledge of basic abstract data types and their Java-based API classes.
- Produce end-user programs which feature event-driven techniques that provide a sensible and easy-to-use GUI.
- Explain what abstract classes and Java interfaces are and how they are used.
- Describe declaration models for run-time storage allocation, garbage collection and type checking.
- Use some of the Java Collections Framework collections to write efficient and portable application programs.
- Define various types of Java generics and show how each is specialized to a class by the client program.
- Write to and read from files using intermediate file I/O operations in a Java program.
- Design, implement, test, and debug intermediate-level Java programs that use each of the following fundamental programming constructs: string processing, numeric computation, simple I/O, arrays and the Java API.
- Write applications that solve problems in one or more application area: mathematics, physics, chemistry, cellular automata, 3-D simulation, astronomy, biology, business, and the Internet.

Textbook
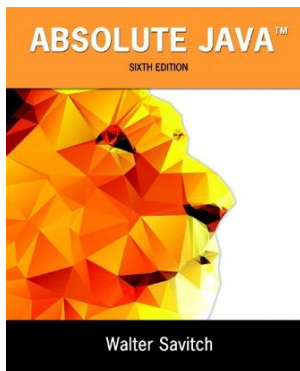
Absolute Java, 6th Edition

By: Savitch & Mock

ISBN-13: 9780134041674

Please note: All the important concepts will be covered in my modules. The text for the course is recommended, not required.

You can order this through the Foothill Bookstore at http://books.foothill.edu/, phone: (650) 949-7305.

Java Software

This course requires that submitted assignments compile and run correctly. We will be working with two software packages this quarter – the Java Programming language, which is available for download as the Java Development Kit (JDK), and the Eclipse Integrated Development Environment (IDE) for writing your programs. If you prefer another Integrated Development Environment (IDE), you are welcome to use that instead.

Course Structure

This course is delivered entirely online through the course management system Canvas. There is a Foothill website for this course at https://foothillcollege.instructure.com, which is used for submitting assignments, viewing grades, and participating in forums. In Canvas, you will access online lessons, course materials, and additional resources.

Course Topics

This course includes the following major topics:

- Classes, Strings, and Method Overloading
- Arrays and multi-dimensional arrays
- Sorting, Searching, and Number Formats
- Multi-Dimensional Arrays and Stacks
- Inheritance
- polymorphism
- Abstract Classes and Interfaces
- Interface Cloneable and Deep Copies
- Java GUIs
- Applets
- Designing and Throwing Exceptions
- The Linked List ADT
- Java Collection Class Generics
- I/O with Files and Streams
- Multithreading
- Recursion

Reading Assignments

Weekly reading assignments will be posted on Canvas. You should set aside 4 to 5 hours every week to complete them. This includes pasting code into your compiler and testing it.

Lab Exercises

The TBA lab hours for this class include three weekly required lab hours, which you will complete from online instructions located only in Canvas.

There will be bi-weekly lab exercises listed under "Quizzes" in Canvas. Laboratory exercises are short and simple exercises designed to introduce a new topic. There will be **5** online labs that supplement each online learning module.

These laboratory exercises contain short programming assignments. Unlike assignments, late submissions will NOT be accepted for labs. Lab topics are announced in the schedule. Lab exercises can be completed using all available resources.

Programming Assignments

Programming assignments are another essential part of this course. There will be **10** programming assignments total throughout the quarter.

For each assignment, students are expected to analyze a problem as well as design and implement the algorithm by coding it into a Java program. Assignments focus on one or more of the learning objectives listed on the first page of the syllabus.

Grading policy

Your code will be graded based upon accuracy, efficiency, clarity, and programming style (including comments). Partial credit is available for partially completed assignments. Grades will be updated on a weekly basis.

Late Policy

There are weekly programming assignments that will be assigned every Monday and due by the following Wednesday at 11:59 PM, unless specified otherwise. Assignments should be submitted through the Canvas website, and I will return assignment grading reports to you through the same website. Assignments are listed under "Assignments" in Canvas.

Programming assignments will be accepted maximum four days after the original due date. They will be considered late and will receive a 10% deduction, with no exceptions. For example, if a programming assignment is due on Wednesday at 11:59 PM, it can be turned in by 11:59 p.m. on Sunday at the latest.

I will not accept any assignment that is more than four days late. Organize your time carefully, and do not wait until the last minute to begin an assignment. Starting assignments early allows time for you to ask questions. I will provide feedback and post assignment grades within the week of the due date.

Exams

Midterm Exam: Friday, May 24, 2019.
Final Exam: Thursday, June 27, 2019.

These exams will be available for exactly 18 hours, starting at 6:00 AM on the due date and closing at midnight. You must take the exam within that 18-hour period. All exams and quizzes will take place on Canvas.

Make-up Exam Policy: NO MAKE-UP TESTS WILL BE GIVEN. If you know in advance that you are unable to make an exam for a valid and unavoidable reason, you must notify the instructor at least one week prior to the scheduled exam date to plan arrangements for a make-up exam. Failure to follow either of these policies will result in a zero. Appropriate documentation and requisite permission are required for a make-up exam.

Communication Policy

Discussion Forums

Since this is an online course that utilizes discussion forums, it is important for all students to participate in the course promptly and actively. The Canvas forum is the main site for our class

discussion. You can ask questions regarding course materials, assignments, and exams on the forum. Students are expected to participate in all graded discussions. Please consider the following general participation expectations:

- Log in regularly and actively participate in the course activities.
- Complete the readings and view other instructional materials for each week before participating in the discussion board.
- Review your posts carefully before submitting them.
- Be respectful of others and their opinions

Think of these forums as our online classroom. The forums on the website are a good way of interacting with other students, exchange thoughts, ask and answer questions as well as take part in the public discussion.

I will check the weekly forums daily and will respond to questions as needed. I also highly encourage students to read and respond to posts made by fellow peers.

First Week Required, Afterwards Recommended

You must post an introduction in the first week of class, or you will be dropped as a "No show" according to the college requirements.

Do Not Post Homework Code

Whether you have a question or an answer suggestion, never post exact homework code to forums. Create a separate small program to display your issue or illustration.

Private Messages

Please use public DT for any question or comment that involves understanding the modules, tests, or assignments. If you have a confidential question (grades or registration), use the Message Tool (MT) by first clicking on Inbox at the far left, then selecting this course and your intended recipient.

Posting Program Code

You can post code to the public discussions that is not directly from your assignment. If you have an assignment question, translate that into a piece of code that does not reveal your answer or submission, exactly.

When posting code fragments (i.e. portions of your program) into questions, make sure these code fragments are perfectly indented and properly formatted.

Grades

Points determine your final grade you earn in the following areas:

Submission	Total Points	Percentage %
Programming Assignments	400	40%
Lab Exercises	200	20%
Midterm Exam	200	20%
Final Exam	200	20%
TOTAL	1000	100%

Grading Scale:

% of Points	Letter Grade	% of Points	Letter Grade
96 – 100	A+	76 - 79	C+
92 – 95	A	70 - 75	C (pass)
89- 91	A-	65 - 69	D+
86 – 88	B+	60 - 64	D
83- 85	B	< 60	F
80- 82	B-	Withdraw	W

Important Dates

Friday, April 19: Last day to add 12-week, quarter-length classes.
Sunday, April 21: Last day to drop for a full refund or credit.
Sunday, April 21: Last day to drop 12-week, quarter-length classes with no record of grade.
Friday, May 3: Last day to request pass/no pass grade.

Academic Accommodations

If you are registered with DRC and have accommodations set by a DRC counselor, please use Clockwork to send your accommodation letter to your instructor and contact your instructor early in the quarter to review how the accommodations will be applied in the course.

DRC Location: Building 5400, Student Resource Center
Phone: 650-949-7017
On the web: http://www.foothill.edu/drc/
Email: drc@foothill.edu

Instructor Announcements and Q&A Forum

The instructor will post announcements on the "Instructor Announcements" page in Canvas throughout the session. Canvas notifies students according to their preferred Notification Preferences as soon as the instructor creates an Announcement.

Withdrawals and Drops

If you decide to drop the course, you must go on MyPortal to officially drop from the course, or you may receive a grade of 'F.' You may also go to the Admissions Office yourself.

To continue in this class, you must participate weekly in all areas: assignments, quizzes, exams, and discussion forums.

You do not need a code from me to drop a course. However, I would appreciate hearing from you before you make the decision to drop a course. Often, we can work out a solution to help you stay in the course.

STEM Success Center

When you need help on an assignment, find yourself confused about a concept, or seek to improve your study skills, visit the STEM Center in Room 4213.

Academic Integrity

Plagiarism and cheating are serious offenses and may be punished by failure on exam, assignment, or lab as well as failure in course and expulsion from the college. No form of cheating (academic dishonesty) is tolerated in this course.

Please review the information on academic honesty before starting. Click on "Academic Integrity" at this link: Academic Integrity.

Technical Assistance

For technical help with your online course, contact the Online Learning Student Help Center.

Resources for Students

- Disability Resource Center
- Foothill Online Learning
- Foothill College Library
- Financial Aid