COSI 12b
Advanced Programming Techniques

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Overview

The course will introduce students to object oriented programming using Java. It will focus on more sophisticated features such as design of classes, interfaces, packages, and APIs. It will also cover the basic principles of software design, testing and collaborative programming.

Upon completion of this class, students will be able to understand the concept of object-oriented programming (OOP) as well as the purpose and usage of inheritance, polymorphism, encapsulation and method overloading. They will be able to create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring. Finally, they will be able to develop programs using the Java Collection API as well as the Java standard class library.

Prerequisites

COSI 11a or programming facility in C.

Learning Objectives

The objective of the course is to:

- Cover issues related to the definition, creation and usage of classes, objects and methods.
- Discuss the principles of inheritance and polymorphism and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces.
- Provide the foundation of good programming skills by discussing keys issues in the design of object-oriented software, including programming design patterns and programming testing.
- Cover the basics of creating APIs as well as allow students to explore the Java Abstract Programming Interface (API) and Java Collection Framework through programming assignments.

Textbook

- Building Java Programs - A Back to Basics Approach (3rd Edition) by Stuart Reges and Marty Stepp, Addison Wesley.
  - ✓ The textbook is optional, however, it makes a useful supplement to the lecture presentations. It contains practice problems and online videos you can use to study for your exams.
- Lecture notes and sample programs will be posted on LATTE.

Software

The recommended software for the course is the Java Development Kit (JDK) and the Eclipse editor.

Grading

The final grades for the course will be determined using the following weights:

- Homework: 40%
- Quizzes and Exam: 50%
- Participation: 10%

- Homework consists of 7 programming assignments done individually. Programs will be graded on "external correctness" (behavior) and "internal correctness" (style and design). Late homework will not receive credit.
- Make-up exam and quizzes will not be given except in case of a serious emergency.

Expectations for Success

COSI 12b is a 4 credit hours course. Success in this course is based on the expectation that students will spend a minimum of 9 hours of study time per week in preparation for class (readings, papers, discussion sections, preparation for exams, etc.).

Course Communications

All course communications will be distributed via the course Latte page.

Class Rules

No laptops, tablets, or phones during lecture.

I find the students' use of laptops, tablets, or phones in class is distracting to other students and to me. If you feel that your learning will be hampered by not having access to your laptop for note taking or other legitimate purposes, please speak to me. Otherwise, keep your devices turned off and stowed away during class.

Academic Honesty

As stated in the Rights and Responsibilities handbook, "*Every member of the University community is expected to maintain the highest   standards of academic honesty. A student shall not receive credit for work that is not the product of the student's own effort*."

Programming assignments must be completed individually (unless specified otherwise by the instructor); all code you submit must be your own work. You may discuss general ideas of how to approach an assignment, but never specific details about the code to write. Any help you receive from or provide to classmates should be limited and should never involve details of how to code a solution.

As a student of this course you are agreeing to the following rules:

- You may not work as a partner with another student on an assignment.
- You may not get code from online sources.

- You may not show another student your solution to an assignment, nor look at his/her solution, for any reason.
- You may not have another person "walk you through" an assignment, describe in detail how to solve it, or sit with you as you write it. You also may not provide such help to another student. This includes current or former students, tutors, friends, TAs, web site forums, or anyone else.
- You may not post your homework solution code online or ask others for online help. This includes public message boards, forums, file sharing sites and services, or any other online system.
- Under our policy, a student who gives inappropriate help is equally guilty with one who receives it. Instead of providing such help to someone who does not understand an assignment, point him or her to other class resources such as lecture examples, the textbook, or emailing a TA or instructor. You must not share your solution and ideas with others. You must also ensure that your work is not copied by others, such as making sure to log out of shared computers, not leaving printouts of your code in public places, and not emailing your code to other students or posting it on the web. We enforce this policy by running similarity detection software over all submitted student programs.