**The College of Staten Island**

**Department of Computer Science**

**CSC 330-E002 [16176] – Object Oriented Software Design – Fall 2022**

**Course Description**

This course covers developing software using object-oriented design paradigms. It deals with large-scale software design issues, object-oriented design paradigms, encapsulation, polymorphism, inheritance, reusability, and specifics of an object-oriented language and associated development tools. Students will be required to implement a substantial and well-engineered project using an object-oriented language. **Prerequisites**: CSC 326 with a grade of C or higher

**Credits and contact hours:** 4 credits, 4 class hours (3 hours lecture, 3 hours lab)

In brief, upon completion of the course students should be able to:

* Understand the paradigm of object-oriented programming, including the features of information hiding, encapsulation, inheritance, composition, polymorphism, abstract classes and interfaces.
* Understand how to utilize OOP to produce reusable code using the previous features, especially knowing when to best utilize each one.
* Understand generic data types and how they correspond to OOP.
* Know the properties and behavior of abstract data types that are included in the standard Java API (such as Lists, Maps, Sets, etc.).
* Know how to form and use UML diagrams as design tools for OOP analysis and design.
* Understand approaches to software design, such as top-down, bottom-up, and the waterfall model, for use in a team project.
* Build excellent communication skills by presenting a group project to a group of peers.
* Build a group project, including a GUI, culminating from the combination of all knowledge in the course, including being able to discuss the design process used and the development cycle.

In detail, student outcomes addressed by Criterion 3 of the course are as follows, where **S = Somewhat supported** and **H = Highly supported**

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| **Outcome** | **Level** | **Course Objectives Met** | **Method of Proficiency Assessment** |
| (a) An ability to apply knowledge of computing and mathematics appropriate to the discipline | H | 1,2,3,4,5,6,7,8 | Lab assignments requiring programming skills, Exams |
| (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution | H | 3,5,6,7,8 | Lab assignments and homeworks |
| (c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs | H | 2,3,4,5,6,7,8 | Lab assignments, homeworks |
| (d) An ability to function effectively on teams to accomplish a common goal | H | 7,8 | Group Project |
| (f) An ability to communicate effectively with a range of audiences | H | 7,8 | Group Presentation |
| (i) An ability to use current techniques, skills, and tools necessary for computing practice. | S | 2,3,4,5,6,7,8 | Homeworks, Labs, Exams, Project |
| (j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. | H | 7,8 | Group Project |
| (k) An ability to apply design and development principles in the construction of software systems of varying complexity. | H | 7,8 | Labs, Group Project |

**Course Information**

Information about the course, including all handouts, assignments, and announcements can be obtained by following your Blackboard account. If you miss any class, you are expected to look at the web site, complete all assignments and readings on time, and be prepared for all scheduled exams and quizzes.

**Instructor** Richard Weir

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**Office Hours**: TBA (Most likely 1N-215 5:30-6:15 on M and W)

**Academic Integrity**

Copying another student’s (or tutor’s) code, or any other form of media, even though you changed up the variable names, is called plagiarism (hence cheating). Cheating results in a zero on the assignment – both for the copyer and copyee.

If you cheat on an exam or quiz – again, you will earn yourself a zero.

Here is the link for the college’s policy on academic integrity:

<https://www.csi.cuny.edu/sites/default/files/pdf/privacy/cuny_academic_integrity.pdf>

**Text** Required Text: Starting out with Java: From Control Structures through Objects, 7th Edition, by Tony

Gaddis, ISBN: 9780134802213

**Grading**

Your grade in this course will be based on a final exam, a midterm exam, programming assignments, homework assignments, attendance, and a team project.

**Programming assignments are graded on a scale of 0 (lowest) thru 10 (highest). For every class day your programming assignment is late, 1 point will be deducted from its grade.**

Homework (from textbook): 10%

Labs: 15%

Midterm: 20%

Team Project: 25%

Final examination: 30%

**Syllabus (order of topics subject to modification)**

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| **Date** | **Topic** | **Other Stuff You Should Know** |
|  |  |  |
| 25-Aug | Intro - Quick Java Whirlwind |  |
| 30-Aug | Class Basics |  |
| 1-Sep | Classes continued |  |
| 6-Sep | Java Special Data Types (Maps and ArrayLists) |  |
| 8-Sep | Data Encapsulation / UML Diagrams |  |
| 13-Sep | Strings and Wrapper Classes |  |
| 15-Sep | Strings and Tokenizing |  |
| 20-Sep | Inheritance |  |
| 22-Sep | Inheritance continued |  |
| 27-Sep | **NO CLASS** |  |
| 29-Sep | **NO CLASS** | Monday Schedule |
| 4-Oct | **NO CLASS** |  |
| 6-Oct | Polymorphism Intro |  |
| 11-Oct | Polymorphism continued |  |
| 13-Oct | Interfaces |  |
| 18-Oct | Abstract Classes |  |
| 20-Oct | Abstract Classes vs. Interfaces |  |
| 25-Oct | Handling Exceptions |  |
| 27-Oct | **MIDTERM** |  |
| 1-Nov | Exceptions continued |  |
| 3-Nov | Handling Exceptions |  |
| 8-Nov | Exceptions continued |  |
| 10-Nov | Advanced File IO - Binary Files |  |
| 15-Nov | Object Serialization |  |
| 17-Nov | JavaFX GUI Intro |  |
| 22-Nov | Simple GUIs continued |  |
| 24-Nov | **NO CLASS** |  |
| 29-Nov | Software Development Life Cycles |  |
| 1-Dec | OOP Design Patterns |  |
| 6-Dec | OOP Design Patterns continued |  |
| 8-Dec | Presentations |  |
| 13-Dec | Final Exam Review |  |
| 15-Dec | **FINAL EXAM Tentative)** |  |

**For Information on Other Dates You Might Find Interesting, click** [**here**](https://www.csi.cuny.edu/sites/default/files/pdf/academicCalendars/FALL2022_ACADEMIC_CALENDAR.pdf)**.**