Department of Computer and Information Sciences
COSC 436 – Object-Oriented Design and Programming
Spring 2024, 436 OOD/OOP, Section 003, Class Number 1626

Instructor: Qingqing Li
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Office: 7800 York Road, Room 458
Course Hours: MW 12:30pm-1:45pm
Course Location: YR 0304
Course Dates: 01/29/2024 - 05/21/2024
Office Hours: Mon/Wed, 11:00 AM – 12:00 PM.
Or appointment by email, please include "COSC 436 Section 003" in the subject.

Blackboard: All materials for the course will be placed on the class Blackboard site. https://www.towson.edu/technology/training/blackboard/students.html

Textbooks: Option1: Object-Oriented Analysis and Design by Ramnath and Dathan; Springer, 2011, ISBN: 978-1849965217
Option2: Head First Design Patterns by Bert Bates, Kathy Sierra, Eric Freeman, Elisabeth Robson O'Reilly.

Course Description: This course provides an overview of object-oriented design and programming technology (OOD/OOP). It covers the fundamental stages in object-oriented design including UML (Unified Modeling Language) and design patterns. Practical implementation will be conducted using the Java programming language. **Prerequisite:** A grade of C (2.0) or higher in COSC 336.

Course Objectives: On completion of this course, students will:

- understand the characteristics of quality software
- have the knowledge of UML
- have the knowledge of OOP and OOD for software development
- be able to perform detailed software design and code implementation
- have a practical experience of using UML, OOP, and OOD

Note that these topics and chapters are subject to change based on student interest, time and discretion of the instructor. An updated schedule will be maintained and posted on Blackboard.

Course Format: Course works including, but not limited to, lectures, quizzes, homework assignments, and Labs. Labs and quizzes will be done during class time. Students are expected to read the textbook and any materials related to the course in the library, the Internet, and provided by the instructor.

Assessment and Grading Policy: Students will be evaluated on the following basis:

Assessment	Percentage	Notes
Quiz	20%	In-class work, Attendance, and Interaction
Homework	25%	Individual assignments
Presentation	10%	Reading books/papers and then presentation
Midterm	20%	Close Book
Final Exam	25%	Close Book

Grade	Points	Grade	Points	Grade	Points	Grade	Points
A	>=92	A-	>=88	B+	>=85	B	>=80
B-	>=78	C+	>=75	C	>=70	C-	>=68
D+	>=65	D	>=60	F	<60		

Homework: Homework assignments requiring individual work will be assigned throughout the semester. Homework may be assigned during the lecture at the instructor's discretion and as the need arises. These assignments will be explained in greater detail as the course progresses. ***All work MUST be turned in by the assigned deadline or the late policy (see below) will be enforced.***

Examinations: There will be two (2) exams for this course: one (1) midterm and one (1) final. The dates of the exams will be announced during the semester. Please check Towson University final exam schedule at http://www.towson.edu/registrar/calendars/exams.html if there are any updates.

In-class lab/quiz: There will be a number of in-class lab/quiz. They are designed to get students to think more about the material discussed in the class. The in-class lab/quiz will NOT be graded based on correctness but will be collected after class and grade based on effort to monitor attendance and counted towards students' final grades.

Collaboration: I encourage you to collaborate the in-class quizzes with someone else. **If you work collaboratively, list your collaborator and a short summary of what each person did**. You can submit one assignment with two names or work together to analyze the problem and develop the solution, then complete the assignment separately. You can collaborate in teams of **up to three students** (i.e., at most three names on one submission). You may work with different partners with different homework assignments.
Note: You are **NOT ALLOWED** to include "guest names." Every person listed as a collaborator must contribute. If someone is listed as a collaborator but did not contribute, all will be given a zero on the assignment and reported to the department.

Late Policy: All assigned work is expected to be completed and submitted by the stated deadline. All assignments and projects submitted after the stated deadline will be marked down 10% for each 24-hour period late. **Note**, in-class quizzes are different, late submission for in-class quizzes are not accepted.

Posting of Grades: University policy prohibits posting of grades in any form. The instructor will NOT disclose any information regarding grades through emails, messages or phone calls. All grades in this course throughout the semester can be accessed online.

Attendance Policy: Students are expected to attend all classes to remain current in the coursework. It is the student's responsibility to remain current on the handouts, assignments, and notes if a class is missed.

If the student is absent from an exam during the scheduled time for that exam, the student will automatically receive a grade of zero (0) for the exam unless: (a) the student notifies the instructor of the absence prior to the exam; (b) the student is ill and supplies a written doctor's excuse explaining the absence; or (c) there is an extraordinary situation which the instructor allows as an acceptable excuse. Only under one of these circumstances, arrangements for a makeup exam will be made.

Blackboard Website: There will be a Blackboard website for this course. Students will be responsible for frequently checking the site for updates and announcements. All course related materials will be available for download from the Blackboard site.

Classroom and Lab Policy: All cell phones, mobile devices, and laptops must be put on silent mode to avoid disruptions and distractions.

Email Policy: All email correspondence with the instructor must be conducted using the student's Towson University email account (i.e., username@towson.edu). The instructor will not read/respond to any email messages from outside accounts. Please include COSC 436 in the subject of all emails, to get a prompt response.

Cheating and Plagiarism: In this course, all quizzes, assignment, projects, and exams carry with them an implicit statement that it is the sole work of the author, unless joint work is explicitly authorized. Help may be obtained from the instructor or other students to understand the description of the problem and any technology, but the solution, particularly the design portion, must be the student's own work. If collaboration work is required, all contributing students must be listed on the submission. Any deviation from this is considered a violation of academic integrity, and as a minimum, will result in failure of the submission and as a maximum, failure of the class, depending on the severity. Students are responsible for reading and knowing Towson University's policy regarding academic dishonesty, located in Appendix F in the Undergraduate Catalog and familiarizing themselves with the policies detailed at http://catalog.towson.edu/undergraduate/appendices/appendix-f-code-student-conduct/.

Course Repeat Policy: Students may not repeat a course more than once without prior permission of the Academic Standards Committee.

Students with Disabilities Policy: This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Disability Support Services (DSS), 7720 York Road, Suite 232, 410-704-2638 (Voice) or 410-704-4423 (TDD). Students who suspect that they have a disability but do not have documentation are encouraged to contact DSS for advice on how to obtain appropriate evaluation. A memo from DSS authorizing your accommodation is needed before any accommodation can be made.

Tentative Topics

1. Introduction of software development

- Software development
- Software quality
- Software security

2. Fundamentals of Object-Oriented Programming

- Main Features of the Java Programming Language
- Encapsulation
- Inheritance
- Polymorphism
- Abstract Class
- Interface
- Package
- Exception Handling

3. Unified Modeling Language (UML)

- Use case diagrams
- Class diagrams
- Sequence diagrams

4. Design Patterns

- Iterator Design Pattern
- Singleton Design Pattern
- Adaptor Design Pattern
- Façade Design Pattern
- Decorator Design Pattern
- Factory Method
- Abstract Factory
- Composite Pattern
- Command Pattern
- Observer Pattern
- Strategy Pattern
- Bridge Pattern
- Template Method Pattern
- Builder Pattern
- Model-View-Controller (MVC) Architectural Pattern
- Prototype Pattern
- Visitor Pattern
- Chain of Responsibility
- Flyweight Pattern
- Proxy
- Explicit Object Release
- Object Cache
- Memento
- Null Object