TOWSON UNIVERSITY
Department of Computer and Information Sciences

Spring 2025

COSC 436: Object-Oriented Design & Programming

COSC 716: Object-Oriented Methodology

Instructor Information

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Office Hours & Contact info:	https://tigerweb.towson.edu/aconover/conover-officehours.pdf
Office Hour Appointments:	Bookings
Policy Overview:	Classroom Policy and Office FAQ.docx
Course Site:	https://blackboard.towson.edu

Course Description

Introduction to object-oriented design and programming technology (OOD/OOP). Main phases in object-oriented design and techniques in object-oriented programming. Programming language design and implementation issues for object-oriented languages. **Prerequisite**: **COSC 336** (for COSC 436) / **COSC 600** (for COSC 716).

Course Objectives

- To understand the characteristics of object-oriented software design.
- To be able to apply object-oriented design principles in support of quality software.
- To understand and be able to express an object-oriented design.
- To understand and appropriately apply design patterns.

Required Textbook

Title: ***Head First Design Patterns***, 2nd Edition (2020)
Authors: Eric Freeman, Elisabeth Robson
Publisher: *O'Reilly Media, Inc.*
ISBN: *9781492078005*

Publisher Site: https://learning.oreilly.com/library/view/head-first-design/9781492077992/
RedShelf: https://www.redshelf.com/app/ecom/search/?terms=9781492078005
VitalSource: https://www.vitalsource.com/products/head-first-design-patterns-eric-freeman-elisabeth-robson-v9781492077954
Cook Library: https://usmai-tu.primo.exlibrisgroup.com/permalink/01USMAI_TU/dg0og1/alma9963987976908249
Amazon: https://www.amazon.com/_/dp/149207800X

Recommended (supplemental) Textbook

Title: ***Object-Oriented Analysis, Design and Implementation***, 2nd Edition, 2015
Authors: Brahma Dathan, Sarnath Ramnath
Publisher: *Springer*
ISBN: *9783319242804*
Publisher Site: https://link.springer.com/book/10.1007/978-3-319-24280-4
Cook Library: https://usmai-tu.primo.exlibrisgroup.com/permalink/01USMAI_TU/dg0og1/alma9963861301908249.

Grading

Assignment Weights:

Exam I (Midterm)	25%
Exam II (Final Exam)	30%
Programming "Projects," Homework Assignments, and quizzes.[1] (Some may be in-class assignments)	45%

Grading Scale (in %):

(Taken directly from the CIS departmental grading guidelines)

A	≥ 93.00	C+	77-79.99
A-	90-92.99	C	70-76.99
B+	87-89.99	D+	67-69.99
B	83-86.99	D	60-66.99
B-	80-82.99	F/FX	≤ 59.99

See Also: **https://www.towson.edu/registrar/grades/**

Important Dates (https://www.towson.edu/registrar/calendars/)

- Last day to ADD/DROP: **February 4th, 2025**
- Last day to WITHDRAW: **April 8th, 2025**
- Spring Break: **March 16th – March 23rd, 2025**
- Last day Of Classes: **May 13th, 2025**
- Last day of Finals: **May 20th, 2025**

[1] *Point values for individual assignments will vary based on their nature and will be specified with the assignment.*

Homework, Projects, and Exams

- **Readings**: *Textbook reading assignments will generally not be explicitly given daily. Instead, a weekly topic/chapter schedule will be provided. Class discussions will be based on the premise that the students have read the material from the text outlined in the schedule.*
  - *The schedule is broken down by the week and not the specific day of that week.* This intentionally allows flexibility to spend more time on a topic if necessary.
  - Additional reading assignments will be given as the semester progresses. These readings may include the Course Textbook(s), Web readings (articles from various websites), Academic or Professional Papers, PowerPoint Slides, and In-Class Code Examples:
    - One of the best ways to understand programming concepts is to "**actively**" study code examples. (By "actively", I mean to trace through a running program, modify the program, observe the results, etc.)
  - While PowerPoint slides will be used occasionally, I will use them sparingly[2]. Instead, I will rely mainly on in-class, "interactive" examples. These examples will generally be posted or modified **after class (sometimes later in the week), as my initial plan may often** detour a bit based on questions, etc. Therefore, I usually must revise the intended example before posting it with detailed comments.

- **Homework**: Homework assignments will be given a specified due date/time. If a date is left unspecified, the assignment will be due at the start of class one week from the date assigned.
  - Note that "Homework Assignments" are generally small sets of practice problems or questions in a separate category from "Programming Projects."
  - Any/all homework is purely for your benefit and is carefully selected to reinforce the essential concepts discussed.
  - To help disincentivize "cheating" (copy/pasting existing solutions, etc.), some homework will be based solely on a "Good Faith Effort," meaning that an apparent "Good Faith" attempt will earn full credit regardless of the correctness of the solutions. *Such Good Faith Effort assignments will be announced in class and noted on Blackboard where applicable. Note that this policy will ONLY apply to assignments with a value of 10 points or less.*

- **Programming Projects/Assignments/Labs**: Programming Assignments will be given a due date/time specified with the assignment.
  - *Please note that it is EXTREMELY difficult to assist with programming assignments via email!*
    - Students are reminded that the instructor is available for help during office hours or appointments.

- **Quizzes**: Periodic quizzes may be held throughout the semester, either announced (or, less frequently, unannounced).
  - These quizzes (if given) will generally be given at the end of any lecture and count as part of the "Homework/Quizzes" score.
  - Since any quizzes will be designed to help assess your progress between exams, they are weighted relatively low, and the "lowest" score for any quiz will be dropped at the end of the semester. ***Make-up quizzes will not be given except in cases of a documented, university-sanctioned absence***.

[2] See: https://www.computerworld.com/article/1343483/u-s-army-discovers-powerpoint-makes-you-stupid.html

- **Exams**:
    - One mid-semester exam and one final exam will be given during finals week.
    - ***Missed exams may not be made up without a documented, university-sanctioned absence***.
        - See the undergraduate catalog for University attendance policies and guidelines for excused absences.
        - The instructor will keep all completed paper exams on file, and students shall not be permitted to retain the exam or copies thereof. Any student wishing to review the exam in greater detail should make an appointment with the instructor, and I'll be happy to go over it with you in person. (In my experience, this is more productive, anyway.)

Assignments and Submissions

- **Blackboard Submissions**: Unless otherwise noted, all assignments will be submitted to *Blackboard* using the submission link associated with each assignment. (blackboard.towson.edu)
    - No *hard copies or emailed assignments will be accepted* unless specifically permitted in the assignment instructions or with the instructor's explicit permission. See the following links for tutorials and system requirements:
        - http://www.towson.edu/Blackboard/minimum.asp
        - http://www.towson.edu/Blackboard/studentresources.asp

- **Source Code Management system submissions:** Depending on the assignment's nature, some assignments may be required via GIT or SVN**.** For such assignments, instructions will be provided in class.

- **Late assignments**: Late Programming Assignments will be assessed a 5% score reduction for each 24 hours that the submission is late. (Weekends will be counted as a single 24-hour period).
    - If you have difficulty completing an assignment (and require additional assistance), contact the instructor before the due date. Submitting incomplete assignments that demonstrate significant progress may be awarded partial credit.

- **Submission Verification**: You are responsible for verifying the proper submission of your assignments. Submission problems should be brought to the instructor after double-checking the technology requirements and *Blackboard* Status announcements.

    - **For Blackboard**: Please do not submit/paste assignment solutions to the "comments" area on the assignment submission screen! If a submission involves multiple files, please *attach/upload* all files you wish to submit in a ***single*** .ZIP file.

    - **VERY IMPORTANT:** If you make a mistake while submitting, you may re-submit before the due date/time. However, please re-submit *all* your work; "re-submissions" completely *replace* any previous submission; they do not *add* to it.

Attendance Policies (See Appendix A for additional notes)

- **General**: All students are expected to be on time for – and remain for the duration of – all class sessions unless the instructor is otherwise notified before the start of class.

- **Record Keeping**: Attendance ***may be taken at any time*** during the course's regularly scheduled lecture or lab sessions. If a student leaves before attendance is taken, they will be considered absent.

- **Missed information**: The student is solely responsible for acquiring any information missed due to an absence. Assignments and select lecture notes will be posted on *Blackboard* as they become available; you should check *Blackboard*, the syllabus, and/or with classmates *for information about any newly posted assignments.*
    - Please note that *Blackboard* should not be construed as a replacement for class attendance; not every instruction given in class will necessarily be repeated on Blackboard.
    - Assignments are expected to be submitted on time regardless of your attendance on a particular day.

- **Absences and Grading**
    - **OVERVIEW**: Class attendance is essential to doing well in the course, and coming to class shows your commitment to doing the work and understanding and learning the material. Students are expected to attend each class meeting, and attendance is mandatory. This class is not **just** a lecture; the lecture notes posted online do not replace class attendance. During the class session, I may use exercises, questions, and other approaches that may challenge students to solve problems – student involvement in these discussions is essential, and this course will weigh attendance and class participation as a small part of the final grade.
        - Each class session can be considered a "1-point" assignment. For example, a class meeting twice a week would have 30 sessions, effectively making the attendance portion a "30-point" assignment. Due to the relatively low overall percentage, no "free" unexcused absences exist.

    - **Note**: All students are expected to be on time for and remain for the duration of class sessions and make every attempt to avoid disrupting the class. (***Signing in and then leaving before the end of class will not count as full attendance*!**) Documentation of the reason for the absence must be supplied to the instructor via appropriate university channels for the absence to be considered excused. If a student is absent from an exam during the scheduled exam time, the student will automatically receive a grade of 0 for the exam unless the appropriate university personnel or office provides a valid excuse.

    - **See**:
        - https://catalog.towson.edu/undergraduate/academic-policies/class-attendance-absence-policy/
        - https://www.towson.edu/studentaffairs/policies/documents/medicalexcuse.pdf

- **Documentation of Absences:** There is no need to send "doctor's notes" (etc.) to the instructor. As I am not qualified to assess the applicability or authenticity of such notes, students should contact Student Outreach and Support if a personal matter interferes with their ability to attend class. Documentation from non-university sources will not be accepted.

Classroom Policies

- **Personal Computing Devices**: The instructor reserves the right to prohibit the use of personal computing devices during lectures, especially if such use is deemed distracting or disruptive to the classroom environment (or to the instructor). This determination will be made at the sole discretion of the instructor. *Cell phones should be silenced before the start of clas*s.

- **Extra Credit**: The instructor intends to make all grading fair and uniform. To this end, "subjective" grading and *individualized "extra credit" assignments will not be given;* all grading criteria will apply equally and uniformly to all students.

- **Email**: When contacting the instructor with a question, your email should originate from your university-assigned student email address and contain a *reference to the course and section*.
    - *Email received from other accounts may be blocked (by any number of spam filters) or significantly delayed.*
    - Any email the instructor sends to the class will be addressed to your student account, so be sure to set up "mail forwarding" if you do not often check your towson.edu account.
    - See: Email/Office FAQ for more information.

University Policies (with supporting links)

For a list of university policies, see: https://www.towson.edu/academics/resources/procedures.html

- **Attendance**: See the Relevant Section from the Undergraduate Catalog.

- **Academic integrity**: It should be noted that the instructor is *obligated* to report any incidents of academic dishonesty to the Office of Academic Affairs. *Note: I try to be reasonable, flexible, and fair in every situation, but this is one area where I have non-negotiable professional, academic, and even personal obligations!*

    - Occurrences of cheating or plagiarism (including the submission of source code copied from the Internet) may yield a failing grade for the assignment or course and are subject to the university's established Student Academic Integrity Policy.
        - Student Academic Integrity Policy FAQs for International Students.
        - Towson University Student Code of Conduct.

- **Course repeat policy**: Students may not *repeat* a course more than once without prior permission of the Academic Standards Committee. (In other words, a Third Attempt requires special permission.)

- **Conduct**: See https://www.towson.edu/studentaffairs/policies/conduct.html

- **Special Needs**: Students with special needs should contact the instructor at the beginning of the semester to discuss any additional assistance required. Every effort will be made to accommodate those requests. See: Students with Disabilities.

- **Other**: For issues not explicitly addressed in this syllabus, the student should consult the Towson University Undergraduate Catalog, the Office of the Registrar, or Student Affairs.
    - Undergraduate Catalog: http://catalog.towson.edu/undergraduate/
    - Office Of the Registrar: http://www.towson.edu/registrar/
    - Policies, Procedures & Guidelines: http://www.towson.edu/studentaffairs/policies/

Topic Schedule:

Schedule_COSC436/COSC716_Spring2025.docx

FAQ:

Conover - Classroom and Email FAQ.docx

Appendix A: Policy Notes

University Academic Policies & Procedures

See: https://www.towson.edu/academics/resources/procedures.html

Course Materials Policy

Lectures and course materials, including lecture notes, PowerPoint presentations, exams, quizzes, labs, and similar materials, are protected by copyright; this includes materials produced by the instructor, other faculty or staff members, and 3rd party content developers who hold copyrights to materials used in the classroom. You may take notes and make copies of course materials for personal use. However, you may not allow others to, reproduce, or distribute lecture notes or other course materials publicly, whether a fee is charged without express written consent from the instructor.

Academic Integrity Policy

The instructor has an obligation to report suspected cases of academic dishonesty. If your graded work is found "substantially similar" to another student's, both students may receive a grade of 0 for that assignment. Subsequent violations may result in a failing grade for the course.

The University's Academic Integrity Policy is published in the Towson University Undergraduate Catalog and is available online at the Student Affairs website.

Academic dishonesty includes plagiarism, fabrication and falsification of work, cheating, abuse of academic materials, and helping other students commit academic dishonesty by allowing them to obtain copies of your work. In short, all submitted work must be your own.

The following is a NON-exhaustive set of examples of academic dishonestly:

- Unauthorized communication of information during a quiz or exam
- Sharing assignments/quizzes/exams information before, during, or after the deliverable in written, electronic, video, or verbal form.
- Copying someone else's work, ***including that of ChatGPT, Copilot, Etc.***
- Giving (or receiving) a detailed explanation of a solution
- Looking at someone else's solution on their screen, with/without their permission
- Two (or more) people writing a single solution to an assignment (unless teamwork is specifically assigned)
- Collaborating with non-students (including siblings, parents, and students from past semesters.)
- Using a substitute to take an exam.
- Helping or attempting to help another student commit an act of academic misconduct.
- Lack of truthfulness or sincerity when interacting with the faculty member regarding an academic exercise.
- Re-using work submitted in previous or other classes.
- Using solutions manuals, providing exam and assignment questions to student websites, or using such a website to complete an assignment and/or exam (including free or pay websites that maintain textbook and/or instructor solutions).
- Acquiring online solutions (this includes paying a tutor to help solve your assigned work or hiring any online service to complete an assignment/quiz/exam for you. E.g., *Chegg*, *Course Hero*)
- Posting your implementation of any work on the internet/web.

Appendix B: Informational Links

University Policy Documents

Academic Policies & Procedures Affecting Students

Classroom Policy and Office FAQ.docx

Blackboard

- Blackboard is Towson's Learning Management System.
- Complete the browser check to ensure your computer will be compatible with all Blackboard tools.
- The Blackboard App gives students and instructors access to their courses, content, and organizations. Available in your phone's marketplace.
- View Blackboard help resources for students (e.g., tutorials) to get started.
- Students should call Blackboard support if they are experiencing issues: 410-704-5151

Virtual Collaboration Technologies

While we are not in a "Virtual Learning" mode this semester, Zoom may be utilized for virtual office hour meetings by appointment. For information on Zoom: Zoom | Towson University

Technical Support

- Student Computing Services (SCS) is your campus resource for technology questions, including Blackboard. You can email SCS, call them at 410-704-5151, chat in the lower right corner of any SCS webpage, text at 410-324-7271, or submit a service request. You may also visit the Student Computing Services labs in Cook 35 and Towson Run 123.

- If you attempt to access Blackboard and it is unavailable beyond scheduled maintenance, please view the OTS Alerts for further information about the system outage.

- Students should also use the CIS-TechHub SharePoint site for connectivity and software help: CIS-TechHub. The CIS-TechHub website provides specific instructions for connecting with lab admins and tutors, installing development environments, connecting to database engines, downloading and running VMs, connecting to the Virtual Workspace "CIS developer's desktop", and accessing other course resources for Windows, Linux, and MacOS. The lab admins use the "Discord" service to answer students' technical questions and share the screen to step through the setup processes. The Discord CIS-TechHub server link is: https://discord.gg/aRUhZcg

Appendix C: Assumed Prior Knowledge

NOTE: Don’t worry if you don’t grasp every concept below, as we will review most of them in class. However, nearly everything listed here comes from COSC236 or COSC237.

Core Java Syntax and Basics

- **Variables and Data Types**:
  - Primitive types (`int`, `double`, `char`, `boolean`) and their uses
  - Differences between primitive types and wrapper classes (e.g., `Integer`, `Double`)
- **Control Flow**:
  - `if/else` statements, `switch` statements
  - Loops: `for`, `while`, and `do-while`
- **Basic Input/Output**:
  - Using `Scanner` for console input
  - Printing with `System.out.println`

Elementary Object-Oriented Programming (OOP) Concepts

- **Class Design**:
  - Defining classes, constructors, and methods
  - Understanding `this` and `super` keywords
  - Fields and methods (Instance and Static)
- **Inheritance and Polymorphism**:
  - Extending classes with `extends`
  - Overriding methods
- **Encapsulation**:
  - Using access modifiers (`public`, `private`, `protected`)
  - Writing getter and setter methods
- **Interfaces and Abstract Classes**:
  - Understanding `interface` and `abstract class` concepts
  - Implementing interfaces with `implements`

Basic Data Structures

- **Java Collections Framework:**
  - Common interfaces (`List`, `Set`, `Map`) and their implementations (`ArrayList`, `HashSet`, `HashMap`)
  - Iterating over collections using loops
- **Arrays**:
  - Defining and manipulating single-dimensional and multi-dimensional arrays
- **Strings**:
  - Basic string operations using `String` class

Exception Handling

- **Try-Catch-Finally:**
  - Writing basic try-catch blocks to handle exceptions
- **Checked vs. Unchecked Exceptions**:
  - Familiarity with Java's exception hierarchy
- **Throwing Exceptions**:
  - Using `throw` and `throws` keywords

Programming Tools

- **Integrated Development Environments (IDEs):**
  - Basic proficiency with *Visual Studio Code*. *Eclipse*, *IntelliJ IDEA*, or other IDEs
  - Creating new projects within an IDE
- **Debugging**:
  - Setting breakpoints and stepping through code.
- **Version Control**:
  - Basic understanding of “Source Code Management” concepts

System Usage

- **Files and directory structures**
  - File and directory hierarchies and organization (saving and finding your files)
  - Basic usage of a Terminal (*Bash*, *Zsh*, *PowerShell*, *CMD*, etc.) to issue commands and navigate a file system