

Comp 345 - Object Oriented Programming

Instructor: Dana Steil
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Office Hours: 2:30 - 5:00 Monday - Thursday

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Text: [C++ How to Program 9th Edition](#) Deitel & Deitel ISBN-10: 0133378713

Course Catalog Description

Object-oriented programming using C++ and/or Java programming language(s). The object paradigm, classes and methods, data abstraction and encapsulation, polymorphism, single and multiple inheritance, interfaces, memory management, operator and function overloading, templates and exception handling. Prerequisite: Comp 245

Prerequisites: [COMP 245 with a C or better](#)

Course Topics

1. Review
2. OOP Languages IDEs Class and Object Creation
 - a. C++
 - b. Java
 - c. C#
 - d. Python
3. OOP Intro
4. Namespaces / Packages
5. Operator Overloading
6. Inheritance
7. Subtype Polymorphism
8. Concrete Classes, Interfaces & Abstract Classes
9. Exception Handling
10. Templates & Generics
11. Enumerations
12. C++ STL
13. Mutable vs Immutable Classes
14. Garbage Collection
15. Design Patterns
 - a. Gamma's
 - b. Dependency Injection
16. Common OOP Architectures
 - a. MVC
 - b. SOA
 - c. Front Controller
 - d. Publish -Subscribe
17. Lambda Expressions
18. LINQ

Student Learning Outcomes (SLOs)

Students will be able to:

1. Describe the principles of object-oriented programming.
2. Investigate a problem, develop the structures needed to represent its objects and operations, and implement them.
3. Understand and demonstrate the concepts of object-oriented design, encapsulation, inheritance, polymorphism, information hiding, and inheritance.
4. Implement classes in C++ and Java and learn the key differences between them.
5. Understand and apply common design patterns and use them in their proper contexts.

Quizzes from reading

A weekly quiz will be given covering the reading assigned in your text that week. The quizzes will be designed to make sure you are keeping up in your reading. It is very likely that material on a quiz has not been discussed in class. It is your responsibility to become familiar with that material for future quizzes, exams, and or programming assignments.

Quizzes are due on Canvas <https://harding.instructure.com/> most Fridays.

Course Grades

See schedule at <https://www.harding.edu/dsteil/345/schedule.pdf>

Missing an exam or Quiz:

Unexcused absences will result in a zero on an exam or quiz. If an exam is missed with an excused absence a makeup exam will be offered. If a quiz is missed with an excused absence you must request a makeup quiz before the next class period. The final cannot be missed.

Extra Credit

I will add .1% to your course average for each time you attend a Computer Science departmental seminar. Seminars are generally held at 7:00 am on Fridays in Sci 113, some additional seminars are held at 4:00 pm on Thursdays. The first seminar will be in 2-3 weeks.

Turning in late programming assignments:

All work is due at the time listed on the assignment or in EASEL. **Late assignments will be accepted until the first day of the last week of regular class meeting.** 10% per day (max of 50%) will be deducted.

Phones & Other Distractions:

During class time students may not use phones to talk, text or for any other purpose. Your ringers should be turned off before class starts. Laptops or class room machines may only be used for note taking or assignments related to the lecture in progress. Misuse of phones or computers during class will result in a 10% penalty on the following exam.

Attendance:

You are expected to attend class. **I will take attendance.** After 3 unexcused absences your course grade will be lowered by 10 points. After 10 unexcused absences you will be withdrawn from the course. 2 tardies = 1 absence.

Academic Integrity

Honesty and integrity are characteristics that should describe each one of us as servants of Jesus Christ. As your instructor, I pledge that I will strive for honesty and integrity in how I handle the content of this course and in how I interact with each of you. I ask that you join me in pledging to do the same.

Academic dishonesty will result in penalties up to and including dismissal from the class with a failing grade and will be reported to the Associate Provost. All instances of dishonesty will be handled according to the procedures delineated in the Harding University catalog.

Each student is expected to do his/her own work. Copying of others' assignments is NOT permitted. Working in groups, when not instructed to do so is not permitted.

Phones and other electronic devices are not permitted during exams and in-class quizzes. Use of these will at minimum result in a failing grade for the assignment.

Food & Drink:

Please do not bring any food to class. Drinks are allowed in non-computer-lab rooms (be very careful).

Students with Disabilities:

It is the policy for Harding University to accommodate students with disabilities, pursuant to federal and state law. Therefore, any student with a *documented disability* condition (e.g. physical, learning, or psychological) who needs to arrange reasonable accommodations must contact the instructor and the Disabilities Office at the *beginning* of each semester. (If the diagnosis of the disability occurs during the academic year, the student must self--identify with the Disabilities Office *as soon as possible* in order to get academic accommodations in place for the remainder of the semester.) The Disabilities Office is located in **Room 205** in the **Student Center**, telephone, (501) 279-4019.

Assessment:

***University Assessment*:** Harding University, since its charter in 1924, has been strongly committed to providing the best resources and environment for the teaching-learning process. The board, administration, faculty, and staff are wholeheartedly committed to full compliance with all criteria of the Higher Learning Commission of the North Central Association of Colleges and Schools. The university values continuous, rigorous assessment at every level for its potential to improve student learning and achievement and for its centrality in fulfilling the stated mission of Harding. Thus, a comprehensive assessment program has been developed that includes both the Academic units and the Administrative and Educational Support (AES) units. Specifically, all academic units will be assessed in reference to the following Expanded Statement of

Institutional Purpose: The University provides programs that enable students to acquire essential knowledge, skills, and dispositions in their academic disciplines for successful careers, advanced studies, and servant leadership.

***Departmental Assessment*:** “Near the completion of your major in the department of Computer Science & Computer Engineering, you will be assessed by a comprehensive examination covering core courses in your major. This examination will influence your final grade in the senior capstone course.”

***Course Assessment and Grading*:** Assessment of the knowledge, skills, and dispositions of each student for the purpose of assigning a letter grade at the completion of this course will be based on the criteria set forth in the above section entitled “Grades”.

Time Management Expectations

For every class hour, the typical student should expect to spend at least two clock hours a week of problem solving, reading, reviewing, organizing notes, preparing for coming exams/quizzes and other activities that enhance learning.

Dress Code

All members of the Harding community are expected to maintain standards of modesty and decency in dress appropriate to the Christian lifestyle and consistent with professional employment expectations. For these reasons, students are expected to adhere to an established dress code. All students are expected to abide by the Student Handbook. A student may be asked to leave class or other activities if they are not in keeping with these expectations.

Computer Use in Class

PCs, Laptops, and any other form of computer may only be used in class for the purpose of taking notes or looking up information when prompted by the instructor. Any use for non-class activity such as checking email, social media, games, etc. will result in forfeiture of the privilege of using the computer during class.

Steil Cup

The student in the course with the highest grade at the end of the semester will be honored with a wooden cup crafted by Dana Steil.