COMPSCI 472/572: Object-Oriented Design Patterns

Instructor

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Meetings

Lectures:	TuTh 6:00–7:15	MEC-309
Office hours:	TuTh 1:30–2:30	MEC-302C
	by appointment	MEC-302C

Catalog Description

Designing a flexible and reusable object-oriented software system is difficult. Object-oriented design patterns capture simple, elegant, and recurring solutions to specific object-oriented design problems. This class reviews object-oriented design principles, explains the goals and form of design patterns, and examines several well-known patterns.

Objectives

At the end of this class, a student should be able to demonstrate understanding of the following concepts:

- the meaning and benefits of software reusability
- the form of a software design pattern
- domain-independent versus domain-specific patterns
- how to apply a pattern
- relationships between patterns
- a taxonomy of several well-known object-oriented design patterns
- class patterns versus object patterns

- programming to an interface
- class versus interface inheritance
- inheritance versus composition
- delegation
- inheritance versus parameterized types
- run-time versus compile-time structures
- object-oriented design and programming in C++ and Java

Prerequisites

COMPSCI 125	Introduction to Computer Science I
COMPSCI 225	Introduction to Computer Science II
COMPSCI 342	Data Structures and Algorithms

Textbooks and Other Resources

The textbook is:

- *Design Patterns*, by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides. Addison-Wesley, 1995. ISBN 0-201-63361-2.

Activities

Grades are based on student performance of several kinds of activities. Their weights are listed below.

Homework	40%
Exam	25%
Final	35%

Homework

Six homework programs are assigned during the semester. Homework requires students to progressively develop the textbook's graphical editor, Lexi, in Java. Assignments will be made available online.

Exams

An exam and a final are administered during the semester. They are in-class, open-note, and open-book tests. Computers are prohibited.

Grading

Homework is delivered at the beginning of class on the day it is due. Late work is not accepted.

Makeup examinations are not normally administered.

Scores are posted near my office, as they become available. You are encouraged to check your scores to ensure they are recorded properly. If you feel that a grading mistake has been made, contact me within two weeks of the date that work is returned. Old scores are not changed.

Academic Honesty

The following quotation is from the BSU Undergraduate Catalog. You should read that section.

> *The university's goal is to foster an intellectual atmosphere that produces educated, literate people. Because cheating and plagiarism are at odds with that goal, they shall not be tolerated in any form. Therefore, all work submitted by a student must represent that student's own ideas and effort; when the work does not, the student has engaged in academic dishonesty.*

There is related material in the BSU Student Handbook.

> *The course instructor is responsible for handling each case of academic dishonesty in the classroom except where a major or repeated offense is involved. In a proven case of cheating a student will be dismissed from the class and a failing grade issued.*

There are many forms of academic dishonesty. Some relevant examples include:

- Submitting programs, or parts of programs, written by someone else.
- Viewing exam answers, homework answers, or programs written by someone else. This includes material from other courses and previous semesters.
- Distributing exam answers, homework answers, or programs to someone else, even after it has been graded.

The BSU Undergraduate Catalog contains more examples. If you are unsure about a particular case, ask your instructor,

On homework, a student must work independently. Ideas and general principles can be discussed with other students, but work must be original.

Keep your source code to yourself. See the UNIX commands `chmod go-rwx` and `ls -l`.

On exams, of course, each student must work entirely independently.

Computer Accounts

Each student receives an account on the department's network of computers, which run the LINUX operating system. If you are unfamiliar with the department's computers, you are urged to attend office hours during the first week or two of classes. I'll try to get you started with these powerful tools.

You are responsible for understanding and complying with the departmental computing policy.

Schedule

Week	*Date*	*Topic*	*Assigned*	*Due*	*Reading*
1	Aug 28 Tue				
	Aug 30 Thu				1
2	Sep 04 Tue				
	Sep 06 Thu		HW#1		2
3	Sep 11 Tue				
	Sep 13 Thu				
4	Sep 18 Tue				
	Sep 20 Thu				
5	Sep 25 Tue				
	Sep 27 Thu				
6	Oct 02 Tue		HW#2	HW#1	
	Oct 04 Thu				
7	Oct 09 Tue				
	Oct 11 Thu				
8	Oct 16 Tue		HW#3	HW#2	
	Oct 18 Thu				
9	Oct 23 Tue				
	Oct 25 Thu				
10	Oct 30 Tue				
	Nov 01 Thu		HW#4	HW#3	
11	Nov 06 Tue	Exam			
	Nov 08 Thu				
12	Nov 13 Tue		HW#5	HW#4	
	Nov 15 Thu				
13	Nov 20 Tue	Thanksgiving			
	Nov 22 Thu	Thanksgiving			
14	Nov 27 Tue				
	Nov 29 Thu		HW#6	HW#5	
15	Dec 04 Tue				
	Dec 06 Thu				
16	Dec 11 Tue			HW#6	
	Dec 13 Thu				
17	Dec 20 Thu	Final: 5:00-7:00			