

Master Course Syllabus
School of Engineering and Computer Science
Washington State University Vancouver

CS 471
Professional Programming: Problems and Practice
3 Semester Hours

Catalog Description

Application of OOP techniques to a variety of challenging, real world problems; industrial program development processes, peer reviews and interpersonal skills presented and exercised.

Prerequisite Courses

CS 320 – Fundamentals of Software Engineering

CS 360 – Systems Programming

Senior standing

Prerequisite Topics

- Software design principles
- Proficiency with C and systems programming experience
- Experience applying advanced algorithms and data structures
- C++ experience helpful

Measured Course Outcomes

Students taking this course will:

1. Design and implement algorithms using object-oriented design and programming techniques to solve computational problems (*contributes to performance criterion K-4*)
2. Make proficient use of an object oriented language to solve computational problems (*contributes to performance criterion I-2*)
3. Present and participate in oral peer reviews of student problem solutions (*contributes to performance criterion F-2*)

Required Textbooks

Design Patterns: Elements of Reusable Object Oriented Software, by Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides, Addison-Wesley, 1994, ISBN: 0201633612.

Reference Material

C++ Pocket Reference, by Kyle Loudon, O'Reilly & Associates, 2003, ISBN: 0596004966.

Major Topics Covered in the Course

1. Object-Oriented Design and Programming Principles
2. Applying Object-Oriented Design Patterns
3. Object-Oriented Programming and Language Usage
4. Software Fitness
5. Workplace Methods and Behaviors

Laboratory Projects

Programming problems will be assigned on an approximately weekly basis. Problems are frequently taken from the ACM International Collegiate Programming Contest or similar sources. These problems are generally very challenging and are amenable to multiple solution approaches. Student solutions are evaluated competitively with respect to software fitness criteria and their application of design patterns and object-oriented techniques.

CSAB Category Content

	FUNDAMENTAL	ADVANCED		FUNDAMENTAL	ADVANCED
Data Structures	0	0	Computer Organization and Architecture	0	0
Algorithm & Software Design	0	2	Concepts of Programming Languages	0	1

Oral and Written Communications

Students present and defend their program designs and problem solutions to the rest of the class in a professional style code review.

Social and Ethical Issues

This course has some minor coverage of these topics as they relate to workplace behaviors.

Theoretical Content

This course has no significant theoretical components.

Problem Analysis

All of the course assignments require students to make a detailed analysis of the assigned problem and to analyze their subsequent solution.

Solution Design

The design of programmed solutions to computing problems using Object-oriented methods is the focus of this course. Each of the assigned problems requires a thoughtful object-oriented design, correctly implemented and thoroughly tested.

CC2001

This course provides coverage of topics in the following areas (hours listed are minimums):

PL6. Object-oriented programming [core]	12
AL2. Algorithmic strategies [core]	12

Course Coordinator: Dick Lang
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