Syllabus: CSCI 630 Software Design & Maintenance

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Overview

A study of designing and maintaining complex software. The course builds upon fundamental software engineering skills with an emphasis on: object-oriented software design patterns, anti-patterns, code review and refactoring, and tools for evaluating code quality. Students practice maintaining software by collaborating on a large-scale open source project using automated development operation (DevOps) tools.
Prerequisites: CSCI 430 and classified graduate standing.

Instructor

Kevin Buffardi, kbuffardi@csuchico.edu, Office hours: To be annouced.

Required Materials

Laptop computer; No textbook required
Recommended reading: "Design Patterns: Elements of Reusable Object-Oriented Software" (Gamma, Helm, Johnson, Vlissides) ISBN: 0-201-63361-2

Schedule

This is the tentative semester schedule, subject to change.

1. Course & project introduction, accelerated review of advanced version control (*Git & GitHub*)
2. Interfaces & Advanced Object-Oriented Design principles (*Java*)
3. Introduction to design patterns and anti-patterns
4. Composition pattern designs
5. Implementing Composite, Adapter, & Decorator patterns
6. Creational pattern designs
7. Implementing Singleton & abstract factory patterns
8. Behavioral pattern designs
9. Implementing Iterator, Observer, & Strategy patterns
10. Design Patterns review and exam
11. Bug tracking, code review, & refactoring (*Java, GitHub*)
12. Accelerated review of unit testing (*JUnit*)
13. Build Automation & Continuous Integration (*Gradle, Jenkins*)
14. Static and Coverage Analysis (*PMD, Cobertura*)
15. Project review