

COURSE DESCRIPTION

Department and Course Number	CS491B	Course Coordinator	Chengyu Sun
Course Title	Software Design Laboratory	Total Credits	2

Current Catalog Description:

Software design, including Design Patterns and other strategies for designing software systems. Each student will complete the project initiated in CS 491A resulting in a formal report and project presentation.

Textbook:

None.

References:

- Fowler, Martin. *Refactoring: Improving the Design of Existing Code*, Addison Wesley Professional, 1999.
- McConnell, Steve. *Code Complete*, Microsoft Press, 1993.
- Gamma, Erich and Helm, Richard and Johnson, Ralph and Vlissides, John. *Design Patterns*, Addison Wesley Professional, 1995.

Course Goals:

This is the second part of a two-quarter software design lab, in which each student must develop a non-trivial, individual project under the supervision of the instructor. The goals of the course are

- To improve the ability of the students to undertake complex individual projects by guiding them through the later stages of a project development cycle, which include implementation, testing, documentation, and deployment.
- To improve the oral communication skills of the students through two to three oral presentations.
- To improve the written communication skills of the students through the writing of a formal project report.

These course goals contribute to the success of **Student Learning Outcomes 1.a, 3, 4, 5, and 6.**

Prerequisites by Topic:

This is the second part of a two-quarter software design lab. Only students who have passed the first part of the lab (CS491A) may take this course to complete their projects.

Major Topics Covered in the Course:

- Design patterns
- Architecture analysis
- Development tools
 1. Build
 2. Source Version Control
 3. Logging
 4. Documentation
- Emerging trends in software development
 1. Aspect-oriented Programming
 2. Attribute-oriented Programming
 3. Test-oriented Programming
 4. Agile Programming
 5. Extreme Programming
- Platforms and frameworks
 1. J2EE
 2. .NET

Laboratory Projects (specify number of weeks on each):

Each student works on an individually selected project for the entire course. The schedule of the project can be roughly outlined as follows:

- Week 1: Re-evaluation of project objectives and schedules
- Week 2-7: Implementation
- Week 8-9: Testing and refinement
- Week 10: Project presentation

Estimate Curriculum Category Content (Quarter Hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms			Data Structures		
Software Design	2.0		Prog. Languages		
Comp. Arch.					

Oral and Written Communications:

Each student must give two to three presentations during the quarter, including a final presentation on the proposed project. Each presentation is 30 minutes long, and the audience may ask questions at any time during the presentation. The instructor grades all class presentations and gives feedback to the students.

Each student must also complete a draft project report in the first part of the quarter and a final project report at the end of the quarter. Both the draft and the final version of the report are reviewed by the instructor, and feedback is given to enable students to improve their written communication skills.

Social and Ethical Issues:

No significant component.

Theoretical Content:

No significant component.

Problem Analysis:

Students are required to re-evaluate the objectives of their projects and adjust their schedules if necessary.

Solution Design:

The design phase of the project is completed in the first part of this software design lab (CS491A). The emphases of this course are project implementation and testing, as well as delivering the end product on schedule.