

SE 4770 : SOFTWARE ENGINEERING CAPSTONE EXPERIENCE

<i>Semester Hours:</i>	3.0	<i>Contact Hours:</i> 3
<i>Coordinator:</i>	Joseph T. Chao	
<i>Text:</i>	Head First Software Development	
<i>Author(s):</i>	DAN PILONE AND RUSS MILES	
<i>Year:</i>	2007	

SPECIFIC COURSE INFORMATION

Catalog Description:

A synthesis of classroom knowledge and skills in computer science and software engineering, culminating in a comprehensive software engineering team project experience. Covers two or more areas of software engineering. Prerequisite: Grade of C or better in SE 3540 and CS 4620, and completed at least 15 credit hours of CS/SE courses at 3000-level or higher. Credit can be earned for only one of these courses: SE 4770, CS 4770, CS 4540.

Course type: **REQUIRED**

SPECIFIC COURSE GOALS

- Synthesis: develop the project scope and relationship to one or more CS or other domains(s), inputs and outputs.
- Design: integrate a range of course learning and extra-curricula experience to design potential solutions/algorithms by compiling trade-offs, exploring patterns, and modularizing the problem.
- Application: adapt computer science and/or other domain principles and practices to a meaningful problem.
- Collaboration: adapt skills to collaborate effectively as an individual in a team.
- Communication: compose effective oral and written communication for a variety of audiences in different contexts
- Reflection: assess past experiences and successes and/or failures in the project when shaping their “future selves”.

COMPUTER SCIENCE STUDENT OUTCOMES ADDRESSED BY THIS COURSE

- CS 1 Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions
- CS 5 Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline

SOFTWARE ENGINEERING STUDENT OUTCOMES ADDRESSED BY THIS COURSE

- SE 1 An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- SE 2 An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- SE 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- SE 7 An ability to acquire and apply new knowledge, as needed, using appropriate learning strategies

LIST OF TOPICS COVERED

Students are expected to possess the necessary skillset from earlier courses, and not much traditional lecture material is taught in this course. The instructor is there to facilitate, support, and help students discover the resources necessary to complete the capstone experience. The instructor works closely with students to critique and advise on the team project, and (if necessary,) acts as a liaison between the students and project sponsor. Much of the class time is used to brainstorm project ideas, and help the project team members to collaboratively explore the design and solution space of the project.

- I. Background (15%). Student teams may be assigned a software engineering project, or choose from a list of available projects related to the fields in software engineering. Discuss with project sponsors to understand software requirements and constraints. Work with team members on the selection of programming languages, platforms, and development tools.

- II. Project proposal/plan (10%). Project proposal presentations to the class/project sponsor; identify broad conceptual details and plan of action; project logistics - team members/leader and project milestone and schedule of deliverables.
- III. Software development (50%). Team meetings; milestones; short project progress presentations and reports; discussion with project sponsor/course instructor; constraints and trade-offs/resolution. A high quality working software system is expected at the end of software development.
- IV. Project Report and Presentation (25%). Working software, written report, oral presentation, and digital archive.