COURSE DESCRIPTION

Department and Course Number	**CS 420 (formerly CS 442)**	Course Coordinator	**Gray**
Course Title	**Software Engineering**	Total Credits	**3**

Current Catalog Description
Design and implementation of large-scale software systems, software development life cycle, software requirements and specifications, software design and implementation, verification and validation, project management, and team-oriented software development.

Textbook
Object-Oriented and Classical Software Engineering, 6th ed., by S. Schach, McGraw Hill, 2005.

References *None*

Course Goals
Prepares students for a successful fast-track career in the software industry. Students are exposed to topics and challenges among all phases of the software development process. An appreciation for testing across all phases is instilled throughout all lectures. Students should come away from the course with a better appreciation of the issues of scale with respect to large software development, and the various techniques used to handle the complexity of development.

Prerequisites by Topic
Algorithms and Data Structures

Major Topics Covered in the Course
Topics to be covered include: Scope of software engineering. Problems of software development. Object-oriented technology. The software process. Software planning. Stepwise refinement. Testing. Specification methods. Objects. Design methods. Implementation. Maintenance. CASE (Computer-aided software engineering). Portability and reusability. Computer Ethics. Management of the software development process. Term projects typically involve 3-4-person teams.

Laboratory projects (specify number of weeks on each)

There is no formal lab component to the course, but students work in teams to develop a nontrivial software engineering project that covers the entire life cycle over the 15 weeks of the class.

Estimate CSAB Category Content

	CORE	ADVANCED		CORE	ADVANCED
Data Structures			Computer Organization and Architecture		
Algorithms					
Software Design	40		Concepts of Programming Languages		

Oral and Written Communications

Every student is required to submit at least 3 written reports (not including exams, tests, quizzes, or commented programs) of typically 15 pages and to make 0 oral presentations of typically 0 minutes duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.

Social and Ethical Issues

Throughout the course, occasional reference will be made to the ethical considerations of working in the software industry. Material from the Software Engineering Body of Knowledge (SWEBOK) is introduced, and real-world examples from news paper headlines will be discussed. Overall, this issue crosscuts many lectures and the total time spent on the issue throughout the entire semester is less than an hour.

Theoretical Content

Formal specification languages for specification of design (1 hour)

Problem Analysis

Students learn about all of the phases of the software development lifecycle and gain experience on early techniques for requirements gathering and analysis, leading to developed skillsets for determining the essence of the problem.

Solution Design

All students must produce detailed designs of their project in UML and other specification techniques. The instructor's goal is not to unduly bias the design process, but to give students space to explore the alternatives that go into a design.