COMPUTER SCIENCE 340

SOFTWARE ENGINEERING

I. Introduction

   A. Catalog Description

   Students study the design and implementation of large software systems. Topics include design methodologies, programming team organization and management, program verification and maintenance, human engineering, and CASE tools. *Prerequisites: one of CSCI 281, CSCI 361, or CSCI 455 with a grade of C- or better.* Satisfies a writing requirement in major contracts. Offered Fall term only.

   B. Objective

      1. Students will learn about the tools necessary to develop a system from requirements to operation.

      2. Students may gain experience in working with a group on a medium sized project.

   C. Prerequisites

   Students must have completed one of CSci 281, CSci 361, CSci 455 with a grade of C- or better. There will be exams, and there may be individual and group projects.

II. Required Topics

      1. Design techniques: Top-down design, object-oriented design, design patterns, UML, information hiding, iterative enhancement, program verification.

      2. Organization and Management: Milestones and estimating, chief programmer teams, program libraries, walk-throughs

      3. Program testing and maintenance, including unit and regression testing, memory and execution time profiling, code coverage analysis, memory leak and memory corruption detection, and static checking. Planning for change as part of the development process.

      4. Human engineering, taking into account user needs

      5. Case tools.

      6. Team project: (Optional) Organization, management, and development of a small group project.

III. Bibliography

Frederick Brooks,	The Mythical Man-Month
E. W. Dijkstra,	A Discipline of Programming
Dah, Dijkstra, & Hoare,	Structured Programming
Martin Fowler with Kendall Scott ,	UML Distilled: Applying the Standard Object Modeling Language
David Gries (ed),	Programming Methodology
Erich Gamma, Richard Helm Ralph Johnson, John Vlissides,	Design Patterns: Elements of Reusable Object-oriented Software
Benjamin L. Kovitz,	Practical Software Requirements: A Manual of Content and Style
Craig Larman,	Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design
Steve McConnell,	Code Complete
Martin L. Shooman,	Software Engineering Design, Reliability, and Management
Ian Sommerville,	Software Engineering
Susan Weinschenk, Pamela Jamar, and Sarah C. Yeo,	GUI Design Essentials