Department, Number: CS 4310
Course Title: Software Engineering: Requirements Engineering

Semester hours: 45 hours
Course Coordinator: Yoonsik Cheon and Ann Gates

Current Catalog Description
Methodologies, approaches, and techniques associated with software requirements analysis and definition; process for defining requirements of a system including feasibility study, requirements elicitation, formal specification, modeling, validation, verification, and documentation; other topics include cooperative teamwork and project management; first semester of a two-semester capstone project in which students work with a customer to capture and specify requirements for a real-world application.

Textbook

Other references

Course Outcomes:

Learning Outcomes (in conjunction with CS 4311)

Level 1: Knowledge and Comprehension
Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. The material has been presented only at a superficial level. Upon successful completion of this course, students will be able to:
1a. Define basic software engineering concepts and principles (abstraction, anticipation of change, modularity, stepwise refinement, and separation of concerns).
1b. Define quality attributes such as availability, correctness, efficiency, interoperability, maintainability, portability, reliability, security, modifiability, availability, testability, and usability.
1c. State the main features of process improvement models, e.g., CMM, ISO, PSP, QPI, Plan-Do-Check.

Level 2: Application and Analysis
Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details. Upon successful completion of this course, students will be able to:
2a. Determine which life cycle model to use by analyzing different scenarios.
2b. Apply techniques for eliciting requirements.
2c. Analyze requirements to determine if they meet the attributes of well-written requirements.
2d. Identify risks in software development and project management.
2e. Analyze the course project and determine the local and global impact on computing on individuals, organizations, and society, including consideration of professional software engineering code of ethics.
2f. Relate the importance of professional societies.
2g. Engage in self-directed study to learn new techniques and tools for software requirements definition.

**Level 3: Synthesis and Evaluation**
Level 3 outcomes are those in which the student can apply the material in new situations. Upon successful completion of this course, students will be able to:

3a. Construct a feasibility report that demonstrates ability to engage in self-directed study.
3b. Conduct verification and validation using techniques such as inspections and walkthroughs.
3c. Construct a prototype, which adheres to basic HCI principles, to validate the user interface.
3d. Construct a software requirements specification.
3e. Analyze and model aspects of a problem by applying various modeling techniques.
3f. Demonstrate an ability to assemble and orally present technical work and compose technical documents that are grammatically correct and technically sound.
3g. Apply effective techniques for project management, collaboration, and problem-solving within groups.

**Student Outcomes**
Student Outcomes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 11

**Prerequisites by Topic**
CS 3331 with a grade of C or better and departmental approval

**Major Topics Covered**
- Life cycle models
- Requirements engineering and feasibility study
- Use cases
- Project management
- Prototypes and human computer interface
- Quality and process models
- Reviews