COURSE DESCRIPTION

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<th>Dept., Number</th>
<th>CS 4310 Required</th>
<th>Course Title</th>
<th>Software Engineering: Requirements Engineering</th>
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Semester hours | 45 hours          | Course Coordinator | Yoonsik Cheon and Ann Gates |
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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**

Upon successful completion of this course, students will be able to:

1a. Identify major issues related to developing a human-computer interface.
1b. Understand basic societal issues regarding software development.
1c. Know the purpose of audits, inspections, and walk-throughs.
1d. Define basic software engineering concepts and principles (abstraction, cohesion and coupling, decomposition, encapsulation, information hiding, modularity, partitioning, stepwise refinement, and separation of concerns).
1e. Define quality attributes such as availability, correctness, efficiency, interoperability, maintainability, portability, reliability, reusability, security, simplicity, testability, and usability.
1f. State the main features of process improvement models, e.g., CMM, ISO, PSP, QPI, TPI, CQI, Plan-Do-Check.
1g. Discuss in general terms the main factors in cost estimation.
1h. Discuss basic concepts in project management and team, including elements of cooperative teams.
1i. Describe basic concepts in requirements engineering.
1j. Define the basic elements and purpose of modeling.

**Level 2: Application and Analysis**

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, including conducting interviews and developing a throw-away prototype.
2c. Analyze requirements to determine if they meet the attributes of well-written requirements.
2d. Differentiate between audits, inspections, and walk-throughs.
2e. Conduct a technical review including inspections, walkthroughs and audits.
2f. Detect risks in software development and project management.
2g. Apply project management techniques.
2h. Differentiate among modeling techniques.
2i. Demonstrate skills in cooperative working groups and apply conflict resolution techniques in order to achieve group goals.
2j. Examine potentially negative technical, ethical, or legal implications of software engineering projects on customers or others involved.
2k. Exhibit responsible attitudes and work habits as individuals and groups, in accordance with professional software engineering codes of ethics.
2l. Relate the importance of professional societies.

Level 3: Synthesis and Evaluation
Upon successful completion of this course, students will be able to:

3a. Construct a feasibility report.
3b. Construct a software requirements specification.
3c. Analyze and model aspects of a problem by applying object modeling.
3e. Analyze and model aspects of a problem by applying state transition diagram.
3f. Develop use cases and scenarios.
3g. Assemble and present technical work orally.
3h. Compose technical documents that are grammatically correct and technically sound.
3i. Develop effective techniques for collaboration and problem-solving within groups in order to create finished products of high quality.

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